



R94-300968R  
Project 300968

**GROUNDWATER MONITORING AND SAMPLING  
FOURTH QUARTER 1994  
12354 LAKELAND ROAD  
SANTA FE SPRINGS, CALIFORNIA**

**Prepared for**

**Powerine Oil Company  
12354 Lakeland Road  
Santa Fe Springs, California 90670**

**January 1995**

**AeroVironment, Inc.**

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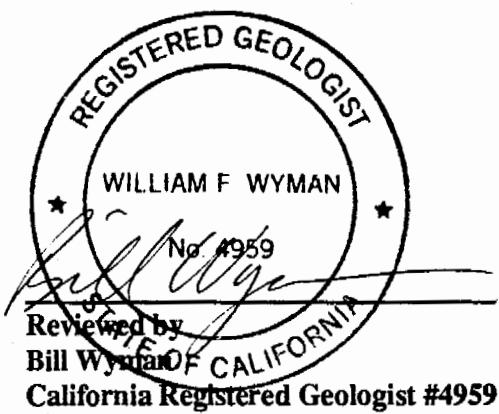
**Powerine Oil Company  
12354 Lakeland Road  
Santa Fe Springs, California 90670**

By

**AeroVironment Inc.  
222 E. Huntington Drive  
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January 1995

Prepared by  
Stuart Berge  
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## Section 1

### INTRODUCTION AND EXECUTIVE SUMMARY

AeroVironment Inc. (AeroVironment) was retained by Powerine Oil Company (Powerine) to collect groundwater samples from monitoring wells located on the property at 12354 Lakeland Road, in Santa Fe Springs, California. This work was conducted on December 15 and 16, 1994 as part of an ongoing quarterly groundwater monitoring and sampling program directed by the State of California, Los Angeles Region, Regional Water Quality Control Board (RWQCB). Fifteen groundwater monitoring wells are included in this quarterly monitoring and sampling program.

Due to the presence of free product in four wells, only eleven groundwater samples were collected. The ground water samples, trip blank, and field blank were analyzed for volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method 624 and for volatile halocarbons by USEPA Method 601. Aromatic VOCs were detected in nine of the eleven groundwater samples collected (except MW-104 and MW-205). The highest concentration of the aromatic VOCs benzene, ethylbenzene, toluene, and total xylene were detected in the sample collected from MW-206 at concentrations of 8,400, 1,800, 4,900 and 9,500 µg/L, respectively.

Halocarbons were detected in ten of the eleven groundwater samples collected (except MW-104). The highest concentrations of the halocarbons trichloroethene and tetrachloroethene, were detected at a concentration of 240 and 95 µg/L, respectively in groundwater collected from MW-101. Neither aromatic VOC's nor halocarbons were detected in the field blank or trip blank.

Four of the groundwater monitoring wells, MW-202, MW-501, MW-600 and MW-601, contained measurable free product ranging from 0.01 to 0.13 feet thick. MW-101, MW-201, MW-203, and MW-204 contained a sheen of free product.

This report includes our field observations, a description of monitoring and sampling procedures, laboratory analytical results, and our conclusions.

## Section 2

### PROJECT DESCRIPTION

#### 2.1 SITE DESCRIPTION

Powerine is located at 12354 Lakeland Road, in Santa Fe Springs, California (Figure A-1). At the refinery, crude oil is processed to make several grades of petroleum, including diesel, gasoline, and jet fuel. Thirteen of the fifteen groundwater monitoring wells monitored during this quarterly monitoring and sampling program are located at the refinery. The other two wells are located off-site at the Metropolitan State Hospital. The state hospital is adjacent to the refinery's southern property line and is down groundwater gradient from the refinery.

#### 2.2 PHASES OF OPERATION

##### 2.2.1 Groundwater Monitoring

On December 15 and 16, 1994, AeroVironment conducted groundwater sampling and free product measurements in 15 groundwater monitoring wells (Figures A-2 and A-3). A Keck Interface Gauging Tape was used to measure both the depth to groundwater and the free product thickness. The wells were monitored in the order of least contaminated to most contaminated in order to minimize any potential cross contamination between wells. AeroVironment's October 1994 report (AV-R-94-300910) was used as the basis for determining the contamination levels in each of the wells prior to monitoring. The gauging tape was decontaminated between each monitoring well by washing first with Alconox, then double rinsing with tap water, and finally rinsing with deionized water. Based on the measured water levels, the groundwater flow direction appears to be approximately south at a gradient of about 0.008 feet/foot (Figure A-4). The groundwater elevations measured ranged from 62.10 feet above mean sea level (MSL) in Well MW-104 to 45.15 feet above MSL in Well MW-600 (Table B-1).

Wells MW-501, MW-600 and MW-601 contained measurable free product on the groundwater and MW-101, MW-201, MW-203, and MW-204 contained a sheen. Table B-1 presents a summary of the free product thickness measurements for these wells up to 0.13 feet thick.

##### 2.2.2 Groundwater Sampling

On December 15 and 16, 1994, AeroVironment collected groundwater samples from MW-101, MW-103, MW-104, MW-210, MW-203, MW-204, MW-205, MW-206, MW-502, MW-503, and MW-504. A 3½-inch diameter 3 foot long Teflon bailer was used to purge MW-103, MW-104, MW-205, MW-206, MW-502, MW-503, and MW-504. The bailer was decontaminated first with Alconox, then double rinsed with tap water, and finally rinsed with deionized water before each well was purged. Purged monitoring well water was put into 55-gallon drums provided by and disposed of by Powerine. The wells were sampled in the order of least contaminated to most contaminated in order to minimize any potential cross contamination between wells. At least three well volumes of groundwater were purged from each well. The pH, electrical conductivity (EC), and temperature were monitored during the purging of each well. After the initial three well volumes were purged, the groundwater continued to be purged until three

consecutive measurements of the pH, EC, and temperature were each within 5 percent of one another. Then a groundwater sample was collected. A new disposable bailer, fitted with a disposable bottom emptying device, was used for each well to collect a sample after the groundwater in the well had recharged to at least 90 percent of its initial level. MW-101, MW-201 and MW-203, and MW-204 contained a sheen of free product. The groundwater in these wells was sampled with a new disposable bailer without purging the well. No groundwater samples were collected in wells that contained measurable free product.

None of the groundwater samples collected showed visible evidence of air in USEPA volatile organic analysis (VOA) vials. The VOA vials were sealed with Teflon septa and a threaded cap. A sample label was attached to each sample vial and included a unique sample identification number and the date and time of sampling. The samples were placed in an ice chest with blue ice and transported to a state-certified laboratory for analysis. Appropriate chain-of-custody requirements were followed. After each sample was collected, the well caps and covers were replaced.

### 2.3 ANALYTICAL RESULTS

Only eleven of the fifteen groundwater monitoring wells were sampled for laboratory analyses. Golden State/CAS Laboratories, a state-certified laboratory, conducted the sample analysis. Appendix C includes a copy of the laboratory reports and chain-of-custody form.

Table B-2 presents a summary of the analytical results for benzene, ethylbenzene, toluene, and xylene. Figure A-5 shows the spatial relation of these results on a site map. The groundwater samples were analyzed for VOCs by USEPA Method 624 and for volatile halocarbons by USEPA Method 601. VOCs were not detected in the field blank or trip blank. Aromatic VOCs were detected in nine of the eleven groundwater samples collected.

Table B-3 presents a summary of the halocarbon results. Halocarbons were detected in ten of the eleven groundwater samples collected at the site. Halocarbons detected were 1,2-dichloroethane (up to 34 µg/L in MW-502), 1,1-dichloroethane (up to 28 µg/L in MW-503), 1,1-dichloroethene (up to 250 µg/L in MW-201), trans-1,2-dichloroethene 4.4 µg/L in MW-205), trichloroethene (up to 240 µg/L in MW-101), tetrachloroethene (up to 95 µg/L in MW-101), and 1,1,1-trichloroethane (up to 1.6 µg/L in MW-101). All remaining halocarbons compounds were less than the laboratory method detection limits. Halocarbons were not detected in the field blank or trip blank.

The highest concentration of aromatic VOCs benzene ethylbenzene, toluene, and total xylenes were detected in the sample collected from MW-206 at concentrations of 8,400, 1,800, 4,900, and 9,500 µg/L, respectively. Aromatic VOCs were not detected above the laboratory reporting limit (5 µg/L) in groundwater sample collected from MW-104 and MW-205.

### **Section 3**

#### **CONCLUSIONS**

All 15 wells at the site were monitored. The monitoring included both groundwater sampling and free product measurements. The highest groundwater elevation was measured in Well MW-104 at 62.10 feet above MSL and the lowest groundwater elevation was measured in Well MW-601 at 44.38 feet above MSL. The groundwater flow direction at the site appears to be south-southeast at an average gradient of 0.008 feet/foot.

Wells MW-202, MW-501, MW-600, and MW-601 contained measurable free product on the groundwater ranging from 0.01 to 0.13 feet thick and MW-101, MW-201, MW-203 and MW-204 contained a sheen of product. Wells that contained measurable free product were not sampled.

Aromatic VOCs were detected above the laboratory reporting in nine of the eleven groundwater samples collected (except MW-104 and MW-205). The highest concentrations of benzene, toluene, ethylbenzene and xylene were detected in groundwater collected from MW-206. Halocarbons were detected in ten of the eleven groundwater samples collected (except MW-104).

## **Section 4**

### **LIMITATIONS**

#### **o Report use**

Services provided under our Contract, including all reports, information or recommendations prepared or issued by AeroVironment, are for the exclusive use of Powerine and will be released by AeroVironment at the written request of Powerine.

#### **o Conclusions**

The conclusions in this report are based on the following:

- Observations by AeroVironment personnel
- Results of laboratory analyses performed by Golden State/CAS Laboratories
- Information provided to us by Powerine Oil Company

Portions of any oral or written report are based on the information acquired during the project specified. The scope of work described here is not intended to be all inclusive, identify all potential concerns, or to eliminate the possibility of having some degree of environmental problems.

This report is based on our understanding of reasonably available regulatory agency rules and regulations, and our observations as indicated in our proposal and this document. It is possible that variations in the soil or groundwater or other site conditions could exist beyond the points explored in the project specified. Additionally, unpermitted, undocumented, or concealed improvements to the property could exist beyond points explored during the course of the project specified. Also, changes in the conditions found could occur at some time in the future due to variations in rainfall, temperature, regional water usage, or other factors.

#### **o Disclosures, Remedial or Mitigative Action**

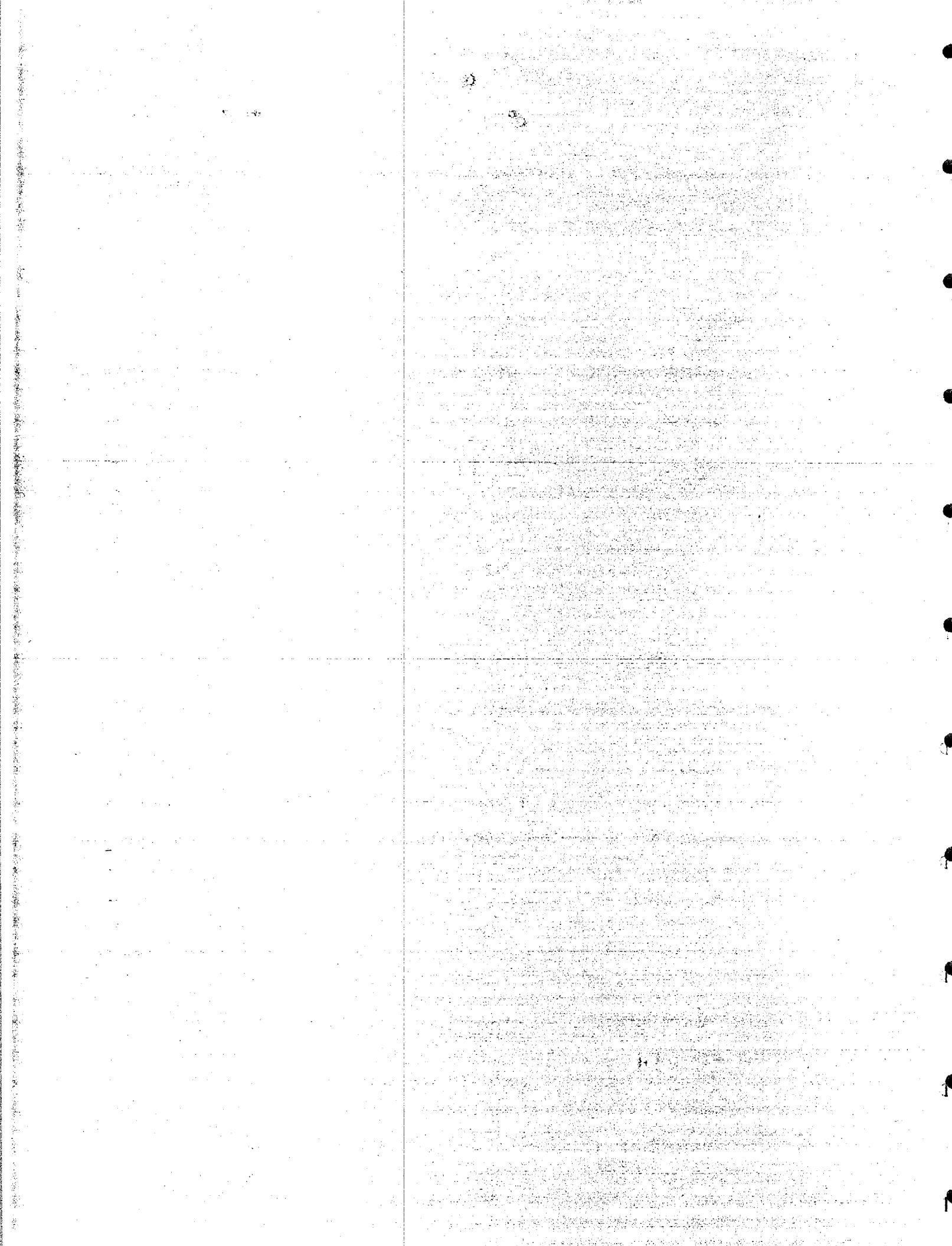
Except as provided in our contract, the responsibility for making any disclosures or reports to any third party and for taking a corrective, remedial or mitigative action shall be solely that of Powerine Oil Company.

#### **o Standard of Care**

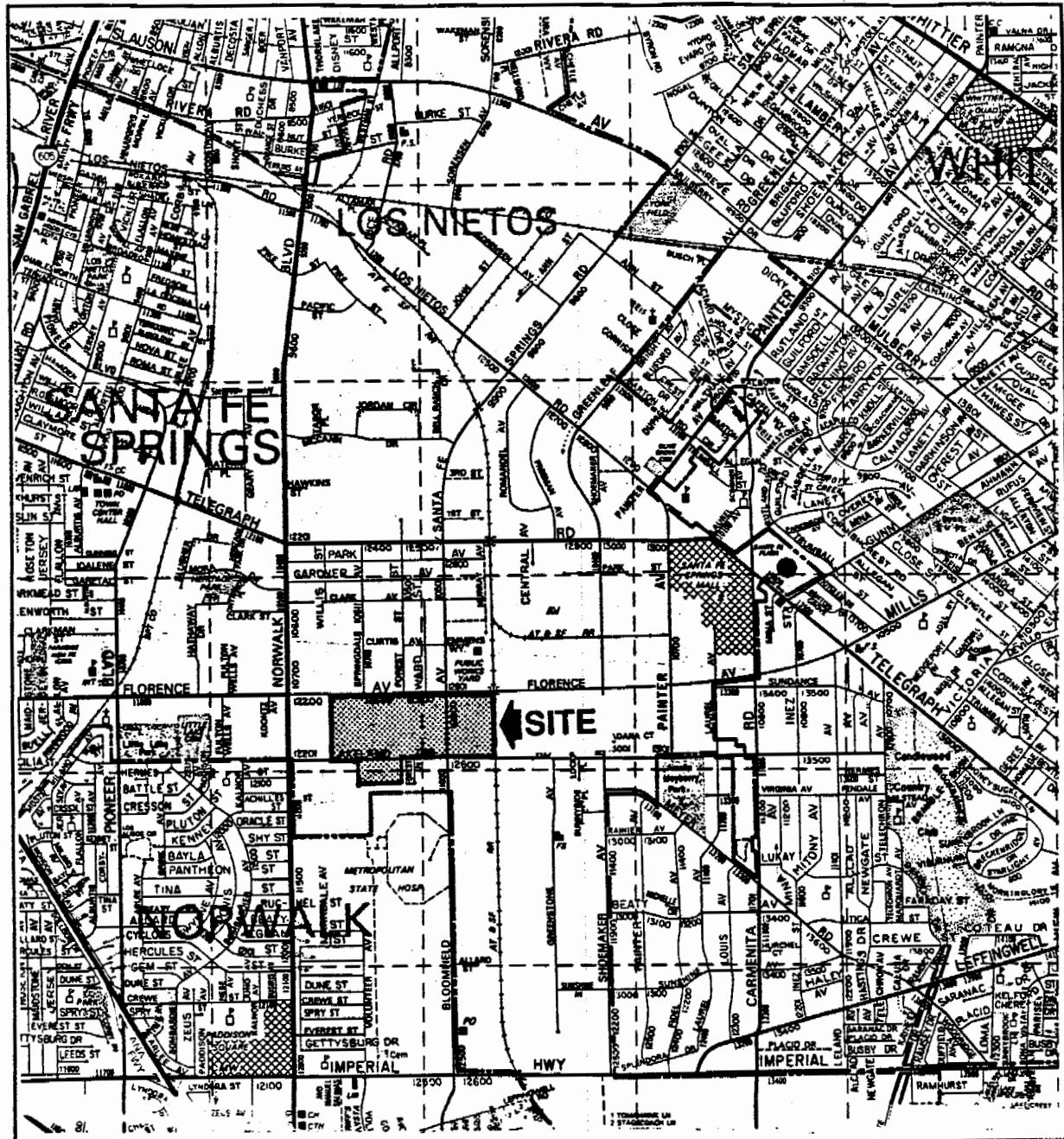
Services performed by AeroVironment have been conducted in a manner consistent with the level and skill ordinarily exercised by members of our profession currently practicing in southern California. No other representations, expressed or implied, and no warranty or guarantee is included or intended in this document.

## **Appendix A**

### **FIGURES 1 THROUGH 5**



91-189A



"Reproduced with permission granted by THOMAS BROS. MAPS. This map is copyrighted by THOMAS BROS. MAPS. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission."

A horizontal scale bar with markings for miles and kilometers. The scale is marked at 0, 1/4, 1/2, 3/4, and 1. Below the scale, the word "MILES" is written above a line of small squares, and the word "KILOMETERS" is written below it.

**Scale in Feet**



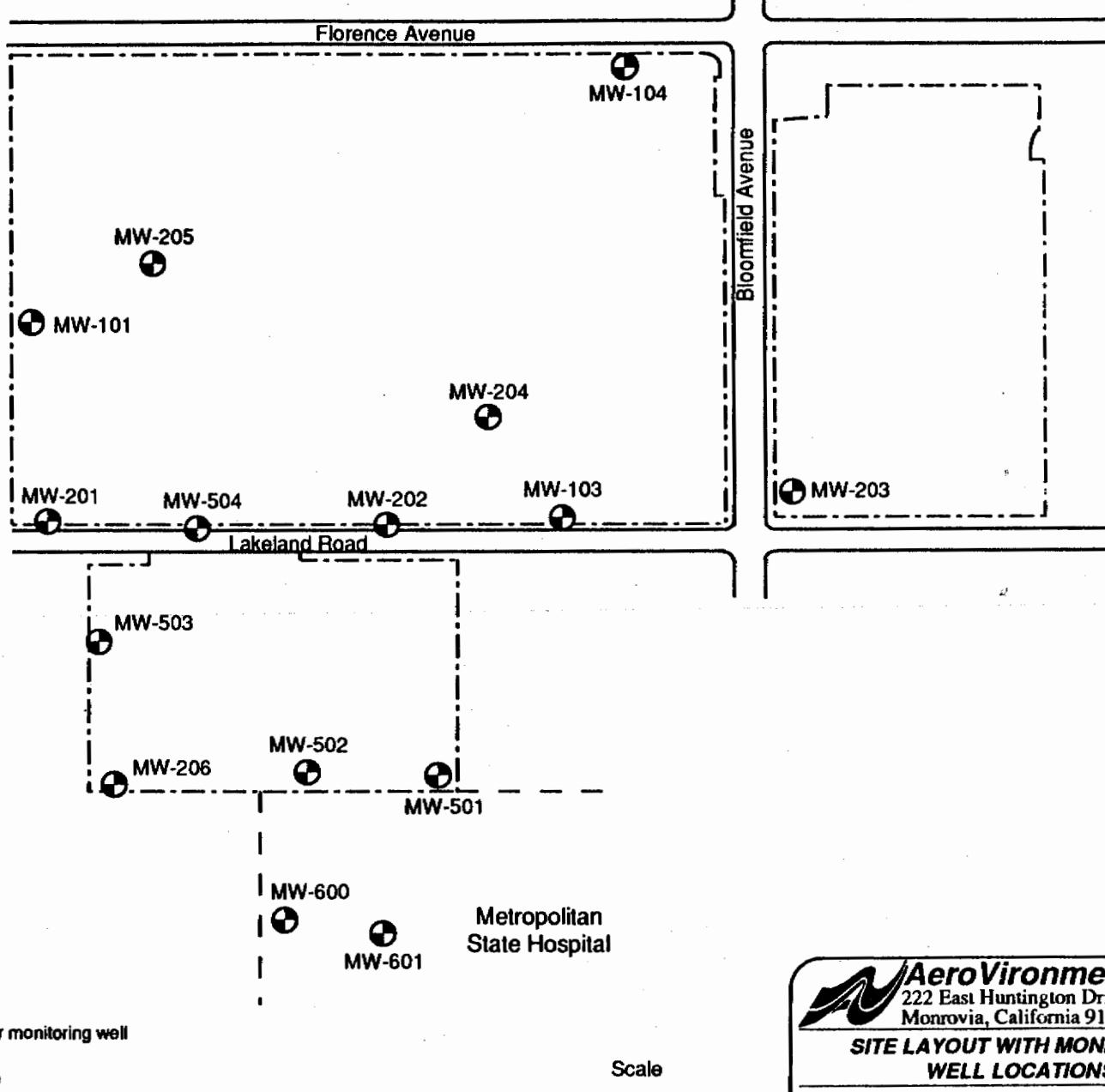
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222 East Huntington Drive  
Monrovia, California 91016

## **SITE LOCATION MAP**

12354 Lakeland Road  
Santa Fe Springs, California

**FIGURE**

A-1



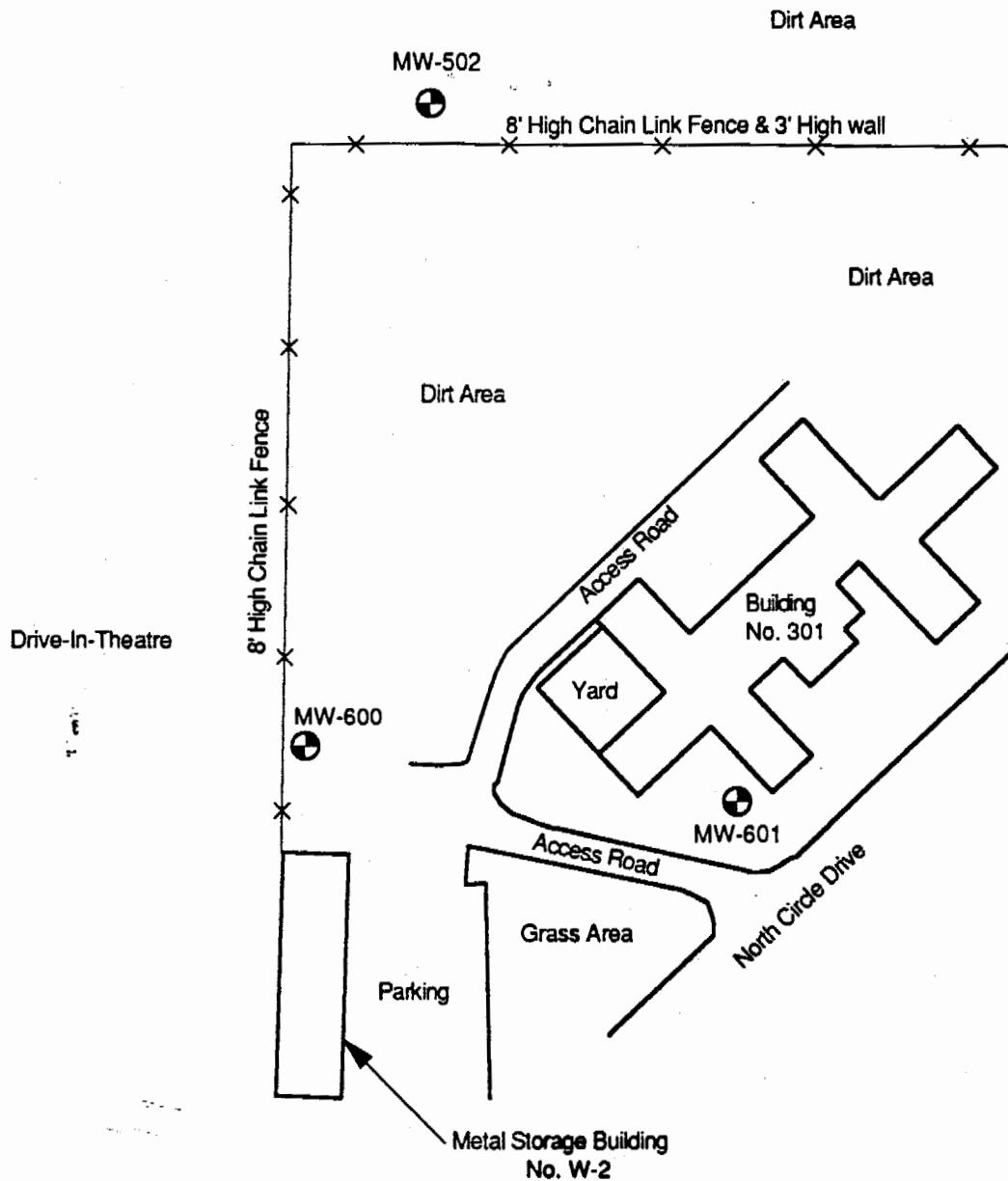
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Monrovia, California 91016

**SITE LAYOUT WITH MONITORING  
WELL LOCATIONS**

Powerine Oil Company  
12354 Lakeland Road  
Santa Fe Springs, California

**FIGURE**

**A-2**

LEGEND

● Monitoring well location

0 25 50 100 150 ft  
SCALE

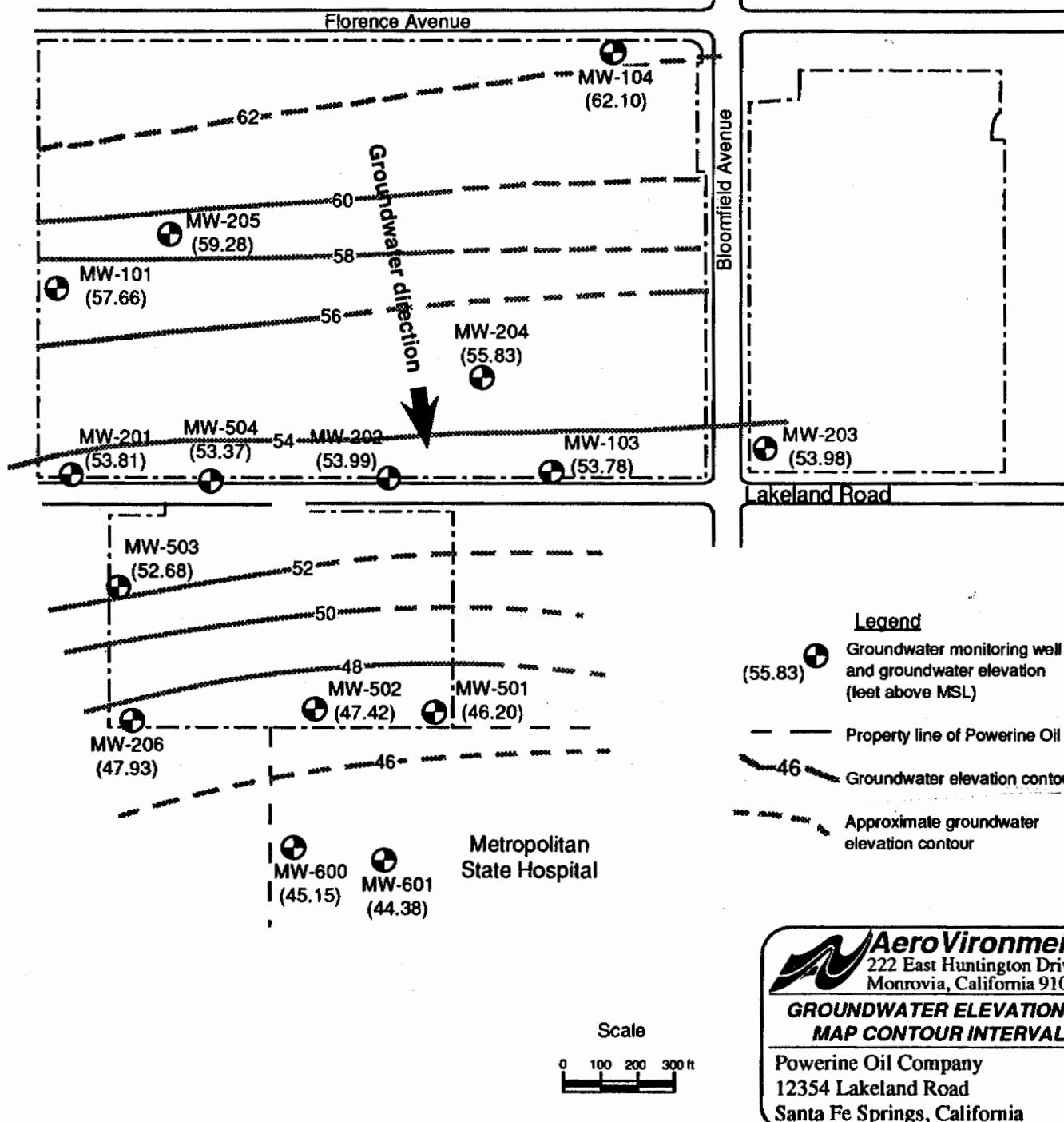


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**SITE LAYOUT WITH MONITORING WELL LOCATIONS**

Metropolitan State Hospital  
11400 Norwalk Blvd.  
Norwalk, California

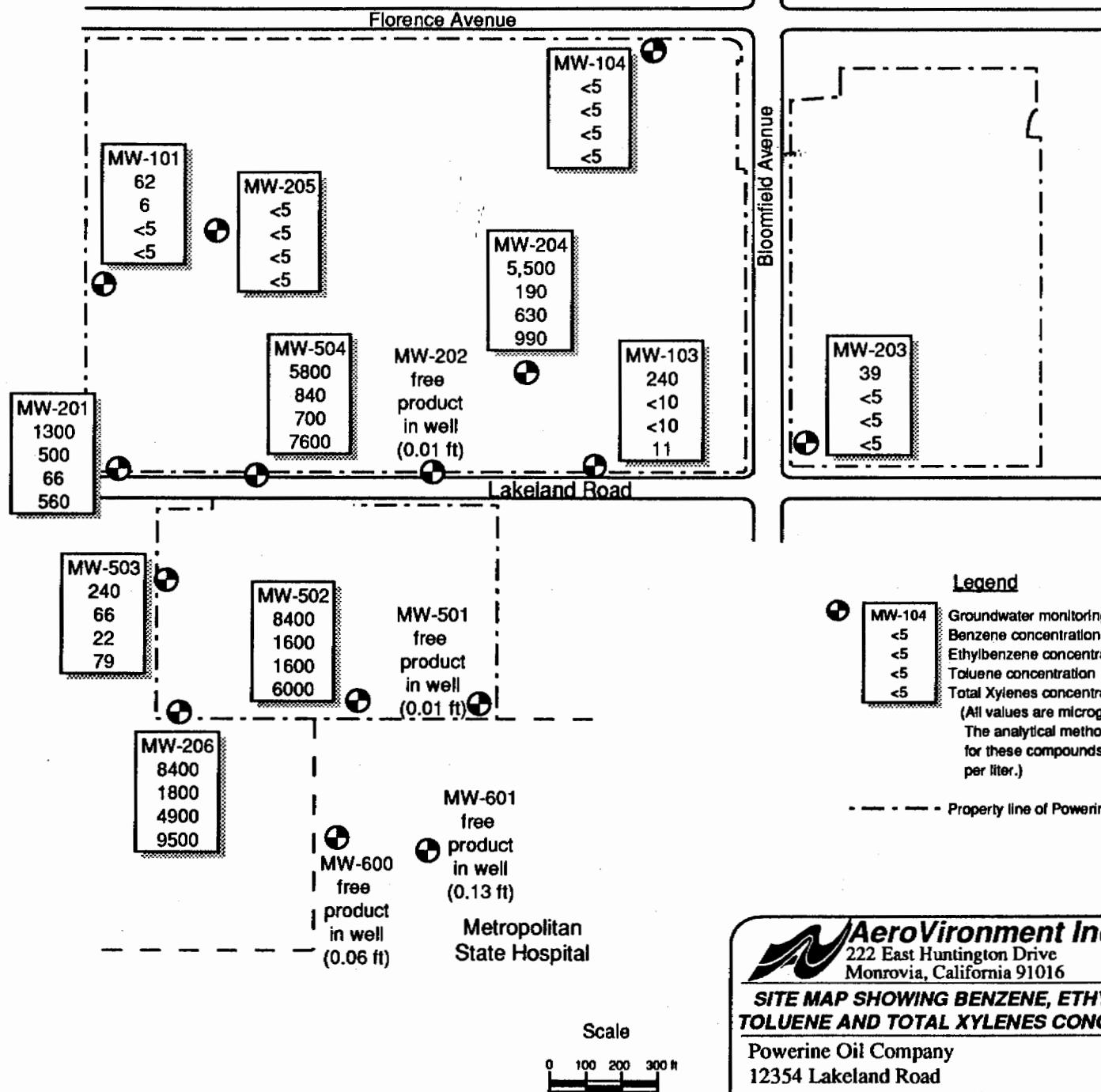
**FIGURE****A-3**



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**GROUNDWATER ELEVATION CONTOUR MAP CONTOUR INTERVAL: 2 FEET**  
Powerine Oil Company  
12354 Lakeland Road  
Santa Fe Springs, California

FIGURE

**A-4**



**AeroVironment Inc.**  
222 East Huntington Drive  
Monrovia, California 91016

**SITE MAP SHOWING BENZENE, ETHYLBENZENE,  
TOLUENE AND TOTAL XYLEMES CONCENTRATIONS**

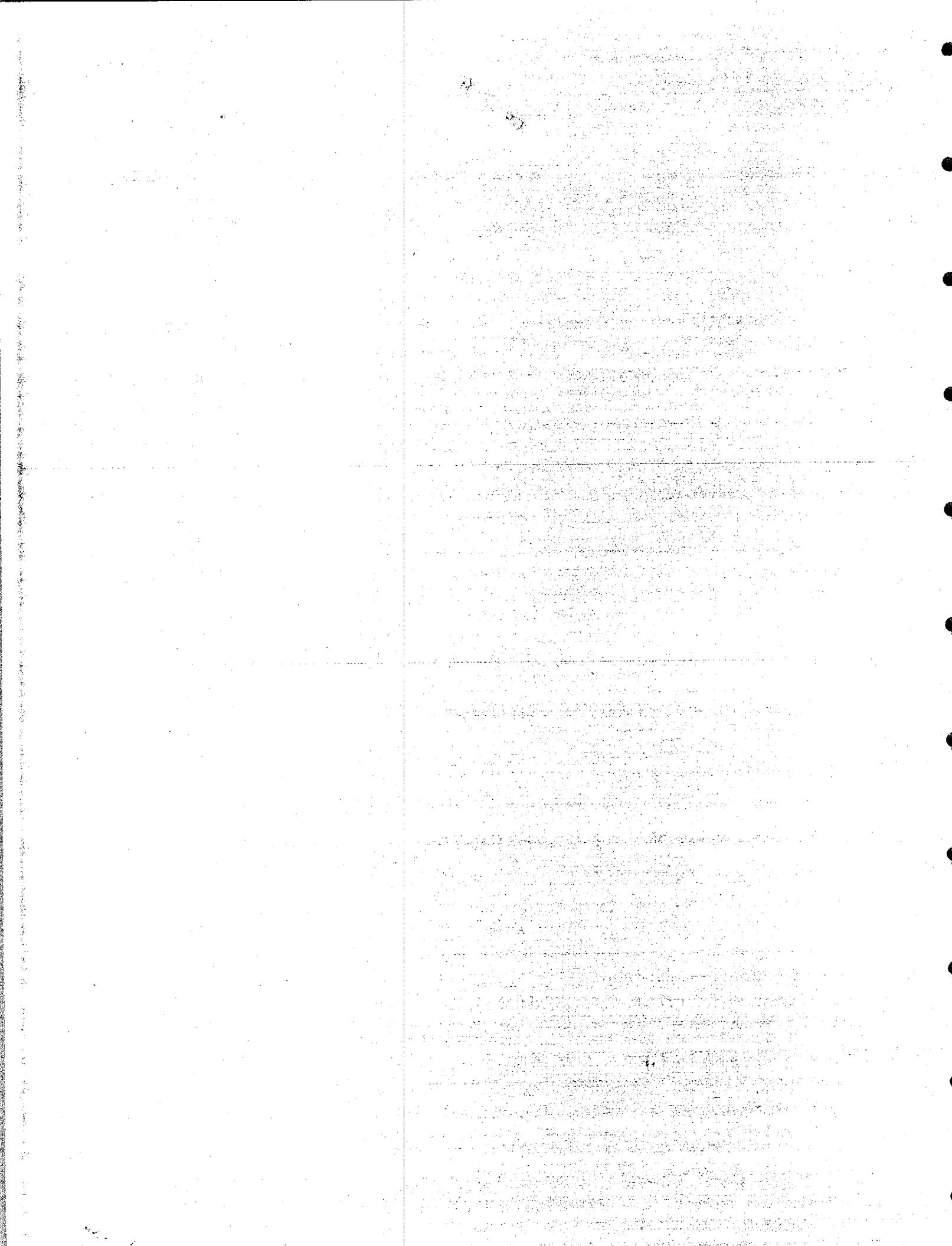
Powerine Oil Company  
12354 Lakeland Road  
Santa Fe Springs, California

**A-5**

**FIGURE**

## **Appendix B**

### **TABLES 1 THROUGH 3**



**TABLE B-1. Summary of groundwater elevation and free product thickness  
(AeroVironment Inc., 1994).<sup>a</sup>**

Well No.	Date	Top of Well Casing Elevation <sup>b</sup> (ft) <sup>c</sup>	Depth to Ground-water (ft)	Groundwater Elevation (ft)	Free Product Thickness (ft)
MW-101	12/94	135.23	77.57	57.66	h
	9/94	135.23	76.64	58.59	0.01
	6/94	135.23	76.38	58.85	0.01
	3/94	135.23	78.10	57.13	0.02
	11/93	135.23	80.83	54.40	0.01
	9/93	135.23	82.34	52.89	0.01
	5/93	No Access to Site			
	3/93	135.23	87.35	47.88	ND <sup>d</sup>
	12/92	135.23	88.69	46.54	ND
	9/92	135.23	88.60	46.63	ND
	6/92	135.23	88.47	46.76	ND
	3/92	135.23	89.87	45.36	ND
	12/91	135.23	90.40	44.83	ND
	9/91	Well damaged; survey marks not valid			
	6/91	134.98	90.24	44.74	ND
	3/91	134.98	91.09	43.89	ND
	12/90	134.98	NA <sup>e</sup>	NA	NA
	9/90	134.98	NA	NA	NA
	6/90	134.98	NA	NA	NA
	3/90	134.98	NA	NA	NA
	12/89	134.98	90.29	44.69	ND
	9/89	134.98	NA	NA	NA
	6/89	134.98	NA	NA	NA
	3/89	134.98	90.28	44.70	ND
	12/88	134.98	90.10	44.88	ND
	9/88	134.98	89.29	45.69	ND
	6/88	134.98	88.66	46.32	ND
MW-103	12/94	136.95	83.17	53.78	ND
	9/94	136.95	82.70	54.25	0.01
	6/94	136.95	83.15	53.80	0.01
	3/94	136.95	84.86	52.09	0.01
	11/93	136.95	87.24	49.71	ND
	9/93	136.95	88.67	48.23	ND
	5/93	136.95	90.90	46.05	ND
	3/93	136.95	93.15	43.80	ND
	12/92	136.95	93.99	42.96	ND
	9/92	136.95	93.73	43.22	ND
	6/92	136.95	93.90	43.05	ND
	3/92	136.95	95.06	41.89	ND

TABLE B-1. Continued.

Well No.	Date	Top of Well Casing Elevation <sup>b</sup> (ft) <sup>c</sup>	Depth to Ground-water (ft)	Groundwater Elevation (ft)	Free Product Thickness (ft)
MW-103 (Con't)	12/91	136.95	95.91	41.04	ND
	9/91	136.95	95.92	41.03	ND
	6/91	136.95	96.08	40.87	ND
	3/91	136.95	96.51	40.44	ND
	12/90	136.95	NA	NA	NA
	9/90	136.95	NA	NA	NA
	6/90	136.95	NA	NA	NA
	3/90	136.95	NA	NA	NA
	12/89	136.95	96.60	40.35	ND
	9/89	136.95	96.20	40.75	ND
	6/89	136.95	95.92	41.03	ND
	3/89	136.95	95.68	41.27	ND
	12/88	136.95	94.76	42.19	ND
	9/88	136.95	93.82	43.13	ND
	6/88	136.95	93.36	43.59	ND
MW-104	12/94	141.60	79.50	62.10	ND
	9/94	141.60	79.37	62.23	0.01
	6/94	141.60	80.55	61.05	ND
	3/94	141.60	82.33	59.27	ND
	11/93	141.60	84.05	57.55	ND
	9/93	141.60	86.15	55.45	ND
	5/93	141.60	87.55	54.05	ND
	3/93	141.60	88.71	52.89	ND
	12/92	141.60	89.10	52.50	ND
	9/92	141.60	89.33	52.27	ND
	6/92	141.60	89.90	51.70	ND
	3/92	141.60	90.45	51.15	ND
	12/91	141.60	90.63	50.97	ND
	9/91	141.60	90.76	50.84	ND
	6/91	141.60	91.02	50.58	ND
	3/91	141.60	91.12	50.48	ND
	12/90	141.60	91.13	50.47	ND
	9/90	141.60	90.96	50.64	ND
	6/90	141.60	90.82	50.78	ND
	3/90	141.60	90.62	50.98	ND
	12/89	141.60	90.17	51.43	ND
	9/89	141.60	89.90	51.70	ND
	6/89	141.60	89.57	52.03	ND
	3/89	141.60	89.15	52.45	ND
	12/88	141.60	88.67	52.93	ND
	9/88	141.60	88.25	53.35	ND
	6/88	141.60	87.95	53.65	ND

TABLE B-1. Continued.

Well No.	Date	Top of Well Casing Elevation <sup>b</sup> (ft) <sup>c</sup>	Depth to Ground-water (ft)	Groundwater Elevation (ft)	Free Product Thickness (ft)
MW-201	12/94	132.91	79.10	53.81	h
	9/94	132.91	78.46	54.45	0.01
	6/94	132.91	78.06	54.85	0.01
	3/94	132.91	79.76	53.15	0.01
	12/93	132.91	82.75	50.16	0.01
	9/93	132.91	84.47	48.44	0.02
	5/93	132.91	86.33	46.58	h
	3/93	132.91	88.84	44.07	ND
	12/92	132.91	90.29	42.62	ND
	9/92	132.91	90.40	42.51	ND
	6/92	132.91	90.10	42.81	ND
	3/92	132.91	91.30	41.61	ND
	12/91	132.91	92.90	40.01	ND
	9/91	132.91	93.57	39.34	ND
	6/91	132.91	93.05	39.86	ND
	3/91	132.91	93.88	39.03	ND
	12/90	132.91	95.43	37.48	ND
	9/90	132.91	94.85	38.06	ND
	6/90	132.91	94.48	38.43	ND
	3/90	132.91	94.91	38.00	ND
	12/89	132.91	94.51	38.40	ND
	9/89	132.91	93.60	39.31	ND
	6/89	132.91	93.00	39.91	ND
	3/89	132.91	92.84	40.07	ND
	12/88	132.91	92.24	40.67	ND
	9/88	132.91	90.77	42.14	ND
	6/88	132.91	90.05	42.86	ND
MW-202	12/94	137.87	83.88	53.99	0.01
	9/94	137.87	83.32	54.55	0.01
	6/94	137.89	83.53	54.36	0.01
	3/94	137.89	85.36	52.53	0.01
	11/93	137.89	87.85	50.04	ND
	9/93	137.89	89.36	48.53	0.01
	5/93	137.89	NA	NA	NA
	3/93	137.89	NA	NA	NA
	12/92	137.89	NA	NA	NA
	9/92	137.89	NA	NA	NA
	6/92	137.89	NA	NA	NA
	3/92	137.89	NA	NA	NA
12/91	137.89	NA	NA	NA	NA
	9/91	137.89	NA	NA	NA

TABLE B-1. Continued.

Well No.	Date	Top of Well Casing Elevation <sup>b</sup> (ft) <sup>c</sup>	Depth to Ground-water (ft)	Groundwater Elevation (ft)	Free Product Thickness (ft)
MW-202	6/91	137.89	NA	NA	NA
(Con't)	3/91	137.89	NA	NA	NA
	12/90	137.89	NA	NA	NA
	9/90	137.89	NA	NA	NA
	6/90	137.89	NA	NA	NA
	3/90	137.89	NA	NA	NA
	12/89	137.89	NA	NA	NA
	9/89	137.89	NA	NA	NA
	6/89	137.89	NA	NA	NA
	3/89	137.89	NA	NA	NA
	12/88	137.89	NA	NA	NA
	9/88	137.89	NA	NA	NA
	6/88	137.89	NA	NA	NA
MW-203	12/94	143.39	89.41	53.98	h
	9/94	143.39	89.61	53.78	0.01
	6/94	143.39	90.68	52.71	0.01
	3/94	143.39	92.27	51.12	0.02
	11/93	143.39	93.84	49.55	0.01
	9/93	143.39	95.81	47.58	ND
	5/93	143.39	96.14	47.25	ND
	3/93	143.89	97.13	46.76	ND
	12/92	143.89	97.50	46.39	ND
	9/92	143.89	97.47	46.42	ND
	6/92	143.89	97.76	46.13	ND
	3/92	143.89	98.39	45.50	ND
	12/91	143.89	98.84	45.05	ND
	9/91	143.89	98.93	44.96	ND
	6/91	143.89	99.19	44.70	ND
	3/91	143.89	99.23	44.66	ND
	12/90	143.89	99.55	44.34	ND
	9/90	143.89	99.09	44.80	ND
	6/90	143.89	98.88	45.01	ND
	3/90	143.89	98.72	45.17	ND
	12/89	143.89	98.19	45.70	ND
	9/89	143.89	97.85	46.04	ND
	6/89	143.89	97.50	46.39	ND
	3/89	143.89	97.15	46.74	ND
	12/88	143.89	96.76	47.13	ND
	9/88	143.89	96.30	47.59	ND
	6/88	143.89	95.98	47.91	ND

TABLE B-1. Continued.

Well No.	Date	Top of Well Casing Elevation <sup>b</sup> (ft) <sup>c</sup>	Depth to Ground-water (ft)	Groundwater Elevation (ft)	Free Product Thickness (ft)
MW-204	12/94	140.14	84.31	55.31	h
	9/94	140.14	83.71	56.43	0.01
	6/94	140.14	84.09	56.05	0.01
	3/94	140.14	85.90	54.24	0.01
	11/93	140.14	88.10	52.04	0.01
	9/93	140.14	89.56	50.58	0.01
	5/93	140.14	91.83	48.31	ND
	3/93	140.14	94.03	46.11	ND
	12/92	140.14	95.08	45.06	ND
	9/92	140.14	94.91	45.23	ND
	6/92	140.14	95.07	45.07	ND
	3/92	140.14	96.45	43.69	ND
	12/91	140.14	97.50	42.64	ND
	9/91	140.14	97.59	42.55	ND
	6/91	140.14	97.85	42.29	ND
	3/91	140.14	98.61	41.53	ND
	12/90	140.14	99.50	40.64	ND
	9/90	140.14	99.08	41.06	ND
	6/90	140.14	98.95	41.21	ND
	3/90	140.14	99.19	41.21	ND
	12/89	140.14	98.70	41.44	ND
	9/89	140.14	98.00	42.14	ND
	6/89	140.14	97.68	42.46	ND
	3/89	140.14	97.53	42.62	ND
	12/88	140.14	96.57	43.57	ND
	9/88	140.14	95.43	44.71	ND
	6/88	140.14	94.95	45.19	ND
MW-205	12/94	139.04	78.76	59.28	ND
	9/94	138.04	77.80	60.24	0.01
	6/94	138.04	77.75	60.29	0.01
	3/94	138.04	79.55	58.49	0.01
	11/93	138.04	82.00	56.04	ND
	9/93	138.04	83.56	54.48	0.01
	5/93	138.04	85.92	52.12	ND
	3/93	138.04	88.60	49.44	ND
	12/92	138.04	89.65	48.39	ND
	9/92	138.04	89.61	48.43	ND
	6/92	138.04	89.59	48.45	ND
	3/92	138.04	90.92	47.12	ND
	12/91	138.04 (well resurveyed)	92.65	45.39	ND
	9/91	138.17	92.45	45.72	ND

TABLE B-1. Continued.

Well No.	Date	Top of Well Casing Elevation <sup>b</sup> (ft) <sup>c</sup>	Depth to Ground-water (ft)	Groundwater Elevation (ft)	Free Product Thickness (ft)
MW-205 (Con't)	6/91	138.17	92.64	45.53	ND
	3/91	138.17	93.49	44.68	ND
	12/90	138.17	94.80	43.90	ND
	9/90	138.17	93.85	44.32	ND
	6/90	138.17	94.12	44.05	ND
	3/90	138.17	94.20	43.97	ND
	12/89	138.17	94.05	44.12	ND
	9/89	138.17	93.20	44.97	ND
	6/89	138.17	92.80	45.37	ND
	3/89	138.17	92.88	45.29	ND
	12/88	138.17	91.92	46.25	ND
	9/88	138.17	90.67	47.50	ND
	6/88	138.17	90.15	48.02	ND
MW-206	12/94	129.93	82.00	47.93	ND
	9/94	129.93	81.81	48.12	0.01
	6/94	129.93	81.30	48.63	0.01
	3/94	129.93	82.89	47.04	0.01
	12/93	129.93	86.43	43.50	0.02
	9/93	129.93	87.91	42.02	0.01
	5/93	129.93	89.60	40.33	h
	3/93	129.93	91.91	38.02	ND
	12/92	129.93	93.50	36.43	ND
	9/92	129.93	93.97	35.96	ND
	6/92	129.93	93.45	36.48	ND
	3/92	129.93	94.32	35.61	ND
	12/91	129.93	96.12	33.81	ND
	9/91	129.93	96.41	33.52	ND
	6/91	129.93	96.11	33.82	ND
	3/91	129.93	96.92	33.01	ND
	12/90	129.93	98.64	31.24	ND
	9/90	129.93	98.02	31.91	ND
	6/90	129.93	97.48	32.45	ND
	3/90	129.93	97.75	32.18	ND
	12/89	129.93	94.75	44.12	ND
	9/89	129.93	96.88	33.05	ND
	6/89	129.93	95.55	34.38	ND
	3/89	129.93	95.20	34.73	ND
	12/88	129.93	94.93	35.00	ND
	9/88	129.93	93.37	36.56	ND
	6/88	129.93	92.37	37.56	ND

TABLE B-1. Continued.

Well No.	Date	Top of Well Casing Elevation <sup>b</sup> (ft) <sup>c</sup>	Depth to Ground- water (ft)	Groundwater Elevation (ft)	Free Product Thickness (ft)
MW-501	12/94	128.70	81.50	46.20	0.01
	9/94	128.70	81.27	47.43	0.01
	6/94	128.70	81.35	47.35	0.01
	3/94	128.70	83.19	45.51	0.01
	12/93	128.70	86.25	42.45	0.01
	9/93	128.70	87.77	40.93	0.01
	5/93	128.70	89.45	39.25	h
	3/93	128.70	91.60	37.10	h
	12/92	128.70	92.99	35.71	0.14
	9/92	128.70	93.42	35.28	0.17
	6/92	128.70	92.98	35.72	0.01
	3/92	128.70	94.14	34.56	0.21
	12/91	128.70	95.91	32.79	0.47
	9/91	128.70	96.12	32.58	0.50
	6/91	128.70	95.94	32.76	0.50
	3/91	128.70	96.83	31.87	0.58
	12/90	128.70	98.82	29.88	1.18
	9/90	128.70	97.80	30.90	0.95
	6/90	128.70	96.02	32.68	0.75
	3/90	128.70	97.62	31.08	0.82
	12/89	128.70	97.15	31.55	0.83
	9/89	128.70	96.17	32.53	0.96
	6/89	128.70	94.62	34.08	0.81
	3/89	128.70	94.81	33.89	0.75
	12/88	128.70	94.41	34.29	0.70
	9/88	128.70	94.39	34.31	1.36
	6/88	128.70	92.46	36.24	1.30
MW-502	12/94	130.82	83.40	47.42	ND
	9/94	130.82	83.03	47.79	h
	6/94	130.82	82.99	47.83	0.01
	3/94	130.82	84.70	46.12	0.01
	12/93	130.82	87.94	42.88	0.01
	9/93	130.82	89.45	41.37	0.01
	5/93	130.82	91.13	39.69	h
	3/93	130.82	93.30	37.52	h
	12/92	130.82	95.14	35.68	0.27
	9/92	130.82	95.51	35.31	0.40
	6/92	130.82	94.95	35.87	0.30
	3/92	130.82	96.00	34.82	0.43
	12/91	130.82	97.97	32.95	0.78
	9/91	130.82	98.20	32.62	0.74
	6/91	130.82	97.95	32.87	0.74

TABLE B-1. Continued.

Well No.	Date	Top of Well Casing Elevation <sup>b</sup> (ft) <sup>c</sup>	Depth to Ground-water (ft)	Groundwater Elevation (ft)	Free Product Thickness (ft)
MW-502 (Con't)	3/91	Well damaged; survey marks not valid			
	12/90	131.19	f	f	0.78
	9/90	131.19	g	g	>1.51
	6/90	131.19	99.16	32.03	1.39
	3/90	131.19	100.96	30.50	1.73
	12/89	131.19	100.40	30.79	1.75
	9/89	131.19	99.08	32.13	2.83
	6/89	131.19	97.27	33.92	3.13
	3/89	131.19	96.75	34.44	ND
	12/88	131.19	96.35	34.84	ND
MW-503	9/88	131.19	94.95	36.24	ND
	6/88	131.19	94.00	37.19	ND
	12/94	134.43	81.75	52.68	ND
	9/94	134.43	81.41	53.02	0.01
	6/94	134.43	80.95	53.48	0.01
	3/94	134.43	82.54	51.89	0.01
	12/93	134.43	86.02	48.41	0.02
	9/93	134.43	87.47	46.96	0.02
	5/93	134.43	88.78	45.65	h
	3/93	131.43	91.67	39.76	h
MW-503	12/92	131.43	93.11	38.32	ND
	9/92	131.43	93.52	37.91	h
	6/92	131.43	93.01	38.42	h
	3/92	131.43	93.98	37.45	h
	12/91	131.43	95.80	35.63	h
	9/91	131.43	96.05	35.38	h
	6/91	131.43	95.79	35.64	ND
	3/91	131.43	96.64	34.79	ND
	12/90	131.43	98.27	33.16	ND
	9/90	131.43	97.70	33.73	ND
	6/90	131.43	97.30	34.13	ND
	3/90	131.43	97.54	33.89	ND
	12/89	131.43	97.16	34.27	ND
	9/89	131.43	96.30	35.13	ND
	6/89	131.43	95.50	35.93	ND
	3/89	131.43	95.18	36.25	ND
	12/88	131.43	94.74	36.69	ND
	9/88	131.43	93.26	38.17	ND
	6/88	131.43	92.55	38.88	ND

TABLE B-1. Continued.

Well No.	Date	Top of Well Casing Elevation <sup>b</sup> (ft) <sup>c</sup>	Depth to Ground-water (ft)	Groundwater Elevation (ft)	Free Product Thickness (ft)
MW-504	12/94	134.51	81.14	53.37	ND
	9/94	134.51	80.59	53.92	0.01
	6/94	134.51	80.43	54.08	h
	3/94	134.51	82.26	52.25	0.01
	11/93	134.51	85.10	49.41	h
	9/93	134.51	86.64	47.87	0.01
	5/93	134.51	88.78	45.73	h
	3/93	134.51	91.09	43.42	h
	12/92	134.51	92.32	42.19	h
	9/92	134.51	92.47	42.04	h
	6/92	134.51	92.28	42.23	h
	3/92	134.51	95.55	40.96	h
	12/91	134.51	95.08	39.43	ND
	9/91	134.51	95.19	39.32	ND
	6/91	134.51	95.20	39.31	h
	3/91	Well damaged; interface probe reached bottom ~98 feet bgs. <sup>i</sup>			
	12/90	133.83	97.47	36.36	1.16
	9/90	133.83	f	f	f
	6/90	133.83	95.75	38.08	0.62
	3/90	133.83	97.10	36.73	.138
	12/89	133.83	96.80	37.03	1.35
	9/89	133.83	99.21	34.02	2.06
	6/89	133.83	94.36	39.47	2.20
	3/89	133.83	96.25	39.59	2.75
	12/88	133.83	94.70	40.53	1.87
	9/88	133.83	93.98	41.91	1.57
	6/88	133.83	92.56	41.27	1.83
MW-600	12/94	120.05	74.90	45.15	0.06
	9/94	120.05	74.73	45.32	0.01
	6/94	120.05	74.40	45.65	0.01
	3/94	120.05	76.01	44.04	0.01
	12/93	120.05	79.49	40.56	0.01
	9/93	120.05	80.99	39.06	0.01
	5/93	120.05	82.52	37.53	h
	3/93	120.05	84.63	35.42	h
	12/92	120.05	86.02	34.03	0.02
	9/92	120.05	86.90	33.15	0.21
	6/92	120.05	86.26	33.79	0.14
	3/92	120.05	87.09	32.96	0.20
	12/91	120.05	88.91	31.14	0.33
	9/91	120.05	89.64	30.41	0.88

TABLE B-1. Continued.

Well No.	Date	Top of Well Casing Elevation <sup>b</sup> (ft) <sup>c</sup>	Depth to Ground-water (ft)	Groundwater Elevation (ft)	Free Product Thickness (ft)
MW-600 (Con't)	6/91	120.05	89.35	30.70	0.90
	3/91	120.05	89.88	30.17	0.88
	12/90	120.05	92.43	27.62	1.64
	9/90	120.05	91.48	28.57	1.17
MW-601	12/94	125.03	80.65	44.38	0.13
	9/94	125.03	80.50	44.53	0.10
	6/94	125.03	80.30	44.73	0.05
	3/94	125.03	82.01	43.02	0.01
	12/93	125.03	85.36	39.67	0.01
	9/93	125.03	86.76	38.27	0.01
	5/93	125.03	88.35	36.68	h
	3/93	125.03	90.38	34.65	h
	12/92	125.03	91.78	33.25	h
	9/92	125.03	92.80	32.23	0.52
	6/92	125.03	91.81	33.22	h
	3/92	125.03	92.66	32.37	h
	12/91	125.03	94.30	30.73	h
	9/91	125.03	94.54	30.49	h
	6/91	125.03	94.27	30.76	h
	3/91	125.03	94.84	30.19	h
	12/90	125.03	97.01	28.02	0.49
	9/90	125.03	96.64	28.39	0.75

a All recent measurements taken December 15-16, 1994 by AV; all data prior to March 1991 collected and reported by ENSR

b Casing elevations provided by client

c ft = feet above mean sea level

d ND = not detected

e NA = not applicable (well dry)

f Access to well restricted

g Obstruction in well above product/water contact

h less than detection limit of interface probe

i bgs = below ground surface

**TABLE B-2. Summary of groundwater sample analytical results by EPA Method 624.  
(AeroVironment Inc., 1994)<sup>a</sup>**

Well No.	Date Sampled	Benzene (µg/L) <sup>b</sup>	Ethylbenzene (µg/L)	Toluene (µg/L)	Total Xylenes (µg/L)
	Analytical Method Detection Limit	5	5	5	5
MW-101	12/94	62	5	<5	<5
	9/94		Free Product		
	6/94		Free Product		
	3/94		Free Product		
	11/93		Free Product		
	9/93		Free Product		
	5/93	i	i	i	i
	3/93	200 <sup>d</sup>	<25 <sup>d</sup>	<25 <sup>d</sup>	<25 <sup>d</sup>
	12/92	290	<5	<5	<5
	9/92	340	<5	<5	<5
	6/92	440	<5	<5	<5
	3/92	NA <sup>c</sup>	NA	NA	NA
	12/91	NA	NA	NA	NA
	9/91	NA	NA	NA	NA
	6/91	NA	NA	NA	NA
	3/91	NA	NA	NA	NA
	12/90	NA	NA	NA	NA
	9/90	NA	NA	NA	NA
	6/90	NA	NA	NA	NA
	3/90	NA	NA	NA	NA
	12/89	NA	NA	NA	NA
	9/89	NA	NA	NA	NA
	6/89	NA	NA	NA	NA
	3/89	NA	NA	NA	NA
	12/88	490	NA	28	<5
	9/88	310	34	10	13
	6/88	620	<5	<5	100
MW-103	12/94	240	<10	<10	11
	9/94		Free Product		
	6/94		Free Product		
	3/94		Free Product		
	11/93 <sup>f</sup>	1400	<250	<250	<250
	9/93 <sup>e</sup>	1300	62	88	230
	5/93 <sup>f</sup>	4800	<250	<250	<250
	3/93	<5	19	8	10
	12/92	350	<5	<5	<5
	9/92	200	<5	<5	<5
	6/92	880	<5	<5	55
	3/92	210	5	<5	23
	12/91	NA	NA	NA	NA

TABLE B-2. Continued.

Well No.	Date Sampled	Benzene ( $\mu\text{g/L}$ ) <sup>b</sup>	Ethylbenzene ( $\mu\text{g/L}$ )	Toluene ( $\mu\text{g/L}$ )	Total Xylenes ( $\mu\text{g/L}$ )
MW-103 (Con't)	9/91	NA	NA	NA	NA
	6/91	NA	NA	NA	NA
	3/91	NA	NA	NA	NA
	12/90	NA	NA	NA	NA
	9/90	NA	NA	NA	NA
	6/90	NA	NA	NA	NA
	3/90	NA	NA	NA	NA
	12/89	NA	NA	NA	NA
	9/89	1000	5	30	5
	6/89	700	5	5	5
	3/89	940	5	5	5
	12/88	370	5	5	5
	9/88	300	5	5	8
	6/88	970	5	74	5
MW-104	12/94	5	5	5	5
	9/94		Free Product		
	6/94				
	3/94				
	11/93				
	9/93				
	5/93				
	3/93				
	12/92				
	9/92				
	6/92				
	3/92				
	12/91				
	9/91				
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	12/90				
	9/90				
	6/90				
	3/90				
	12/89				
	9/89				
	6/89				
	3/89				
	12/88				
	9/88				
	6/88				

TABLE B-2. Continued.

Well No.	Date Sampled	Benzene (µg/L) <sup>b</sup>	Ethylbenzene (µg/L)	Toluene (µg/L)	Total Xylenes (µg/L)
MW-201	12/94	1300	500	66	560
	9/94		Free Product		
	6/94		Free Product		
	3/94		Free Product		
	12/93		Free Product		
	9/93		Free Product		
	5/93		Free Product		
	3/93	560 <sup>e</sup>	<50 <sup>e</sup>	77 <sup>e</sup>	410 <sup>e</sup>
	12/92	1150	<5	<5	560
	9/92	350	<5	<5	130
	6/92	25	<5	<5	<5
	3/92	i	i	i	i
	12/91	340	9	10	80
	9/91	370	<5	<5	130
	6/91	530	<5	<5	<5
	3/91	500	<5	<5	240
	12/90	240 <sup>d</sup>	7	12	55
	9/90	340	20	15	73
	6/90	820	84	49	83
	3/90	350	29	38	85
	12/89	510	24	76	(79) 170
	(200)				
	9/89	830	32	100	210
	6/89	350	<5	<5	50
	3/89	210	24	27	47
	12/88	420	19	65	100
	9/88	520	110	210	400
	6/88	1000	<5	150	250
MW-202	12/94		Free Product		
	9/94		Free Product		
	6/94		Free Product		
	3/94		Free Product		
	11/93 <sup>g</sup>	7700	2600	<500	6300
	9/93	Free Product			
	5/93	NA	NA	NA	NA
	3/93	NA	NA	NA	NA
	12/92	NA	NA	NA	NA
	9/92	NA	NA	NA	NA
	6/92	NA	NA	NA	NA
	3/92	NA	NA	NA	NA
	12/91	NA	NA	NA	NA
	9/91	NA	NA	NA	NA
	6/91	NA	NA	NA	NA
	3/91	NA	NA	NA	NA

TABLE B-2. Continued.

Well No.	Date Sampled	Benzene ( $\mu\text{g/L}$ ) <sup>b</sup>	Ethylbenzene ( $\mu\text{g/L}$ )	Toluene ( $\mu\text{g/L}$ )	Total Xylenes ( $\mu\text{g/L}$ )
MW-203	12/94	39	<5	<5	<5
	9/94		Free Product		
	6/94		Free Product		
	3/94		Free Product		
	11/93		Free Product		
	9/93	40	<5	<5	<5
	5/93	86	<5	<5	<5
	3/93	69	<5	<5	<5
	12/92	64	<5	<5	<5
	9/92	46	<5	<5	<5
	6/92	85	<5	<5	<5
	3/92	120	<5	<5	<5
	12/91	130	<5	<5	<5
	9/91	140	<5	<5	<5
	6/91	100	<5	<5	<5
	3/91	100	<5	<5	<5
	12/90	94	7	<5	Trace (4)
	9/90	130	9	<5	<5
	6/90	88	7	2	2
	3/90	90	<5	<5	<5
	12/89	100	<5	<5	<5
	9/89	80	<5	<5	<5
	6/89	110	5	<5	<5
	3/89	110	<5	<5	<5
	12/88	64	<5	<5	<5
	9/88	76	<5	<5	<5
	6/88	46	<5	<5	<5
MW-204	12/94	5,500	190	630	990
	9/94		Free Product		
	6/94		Free Product		
	3/94		Free Product		
	11/93		Free Product		
	9/93		Free Product		
	5/93 <sup>e</sup>	780	<50	<50	<50
	4/93	130	21	28	193
	12/92	2700	<5	3700	1060
	9/92	90	<5	20	<5
	6/92	110	<5	71	20
	3/92	90	<5	<5	<5
	12/91	47	<5	<5	<5
	9/91	27	<5	<5	<5
	6/91	<5	<5	<5	<5

TABLE B-2. Continued.

Well No.	Date Sampled	Benzene ( $\mu\text{g/L}$ ) <sup>b</sup>	Ethylbenzene ( $\mu\text{g/L}$ )	Toluene ( $\mu\text{g/L}$ )	Total Xylenes ( $\mu\text{g/L}$ )
MW-204	3/91	<5	<5	<5	<5
(Con't)	12/90	<5	<5	<5	<5
	9/90	25	<5	<5	6
	6/90	2	<5	<5	<5
	3/90	9	<5	<5	<5
	12/89	160	<5	<5	<5
	9/89	64	<5	<5	<5
	6/89	76	<5	<5	<5
	3/89	39	<5	<5	<5
	12/88	33	<5	<5	<5
	9/88	6	<5	<5	<5
	6/88	19	<5	<5	<5
MW-205	12/94	<5	<5	<5	<5
	9/94			Free Product	
	6/94			Free Product	
	3/94			Free Product	
	11/93	32	<5	<5	<5
	9/93			Free Product	
	5/93	22			<5
	3/93	<5			<5
	12/92	10	<5	<5	<5
	9/92	5	<5	<5	<5
	6/92	6	<5	<5	<5
	3/92	35	<5	<5	<5
	12/91	85	<5	<5	<5
	9/91	43	<5	<5	<5
	6/91	<5	<5	<5	<5
	3/91	40	<5	<5	<5
	12/90	47	<5	<5	<5
	9/90	45	<5	<5	<5
	6/90	56	<5	<5	<5
	3/90	140	<5	<5	<5
	12/89	170	<5	<5	<5
	9/89	81	<5	<5	<5
	6/89	120	<5	<5	<5
	3/89	40	<5	<5	<5
	12/88	120	<5	<5	<5
	9/88	27	<5	<5	<5
	6/88	13	<5	<5	<5
MW-206	12/94	8400 <sup>e</sup>	1800 <sup>e</sup>	4900 <sup>e</sup>	9500 <sup>e</sup>
	9/94		Free Product		
	6/94		Free Product		

TABLE B-2. Continued.

<u>Well No.</u>	<u>Date Sampled</u>	<u>Benzene (µg/L)<sup>b</sup></u>	<u>Ethylbenzene (µg/L)</u>	<u>Toluene (µg/L)</u>	<u>Total Xylenes (µg/L)</u>
MW-206	3/94		Free Product		
(Con't)	12/93		Free Product		
	9/93		Free Product		
	5/93		Free Product		
	3/93		Free Product		
	12/92	13000	6000	2000	13000
	9/92	9900	3200	1400	7300
	6/92	3200	2100	420	2100
	3/92	2000	2500	470	4870
	12/91	3400	2500	720	4740
	9/91	4500	2000	2100	5400
	6/91	5220	2400	1080	6880
	3/91	4900	2200	2600	9500
	12/90	7100g	2400g	2100g	8100g
	9/90	5100	2300	2100	6800
	6/90	3700	2000	960	6300
	3/90	3700	2600	1700	9400
	12/89	3200	(3600)	2000	1000(1200)
	6600	(10000)			
	9/89	4500	2400	620	6500
	6/89	3100	2300	1200	8600
	3/89	2700	2400	3200	12000
	12/88	4300	2100	920	5500
	9/88	4200	2000	1000	6600
	6/88	5800	2100	2400	4900
MW-501	12/94		Free Product		
	9/94		Free Product		
	6/94		Free Product		
	3/94		Free Product		
	12/93		Free Product		
	9/93		Free Product		
	5/93		Free Product		
	3/93		Free Product		
	12/92		Free Product		
	9/92		Free Product		
	6/92		Free Product		
	3/92		Free Product		
	12/91		Free Product		
	9/91		Free Product		
	6/91		Free Product		
	3/91		Free Product		

TABLE B-2. Continued.

Well No.	Date Sampled	Benzene ( $\mu\text{g/L}$ ) <sup>b</sup>	Ethylbenzene ( $\mu\text{g/L}$ )	Toluene ( $\mu\text{g/L}$ )	Total Xylenes ( $\mu\text{g/L}$ )
MW-501 (Con't)	12/90		Free Product		
	9/90		Free Product		
	6/90		Free Product		
	3/90		Free Product		
	12/89		Free Product		
MW-502	12/94	8400 <sup>e</sup>	1600 <sup>e</sup>	1600 <sup>e</sup>	6000 <sup>e</sup>
	9/94	9800 <sup>e</sup>	1900 <sup>e</sup>	860 <sup>e</sup>	3300 <sup>e</sup>
	6/94		Free Product		
	3/94		Free Product		
	12/93		Free Product		
	9/93		Free Product		
	5/93		Free Product		
	3/93		Free Product		
	12/92		Free Product		
	9/92		Free Product		
	6/92		Free Product		
	3/92		Free Product		
	12/91		Free Product		
	9/91		Free Product		
	6/91		Free Product		
	3/91		Free Product		
	12/90		Not monitored; thought to be destroyed		
	9/90		Free Product		
	6/90		Free Product		
	3/90		Free Product		
MW-503	12/89		Free Product		
	9/89		Free Product		
	6/89		Free Product		
	3/89	5300	1900	1200	7100
	12/88	6500	1500	860	5500
	9/88	1300	2800	180	12000
	6/88	950	62	79	16
	12/94	240	66	22	79
	9/94		Free Product		
	6/94		Free Product		
	3/94		Free Product		
	12/93		Free Product		
	9/93		Free Product		
	5/93		Free Product		
	3/93	2900 <sup>f</sup>	<250 <sup>f</sup>	400 <sup>f</sup>	1880 <sup>f</sup>
	12/92	3300	340	750	1580

TABLE B-2. Continued.

Well No.	Date Sampled	Benzene (µg/L) <sup>b</sup>	Ethylbenzene (µg/L)	Toluene (µg/L)	Total Xylenes (µg/L)
MW-503 (Con't)	9/92			Free Product	
	6/92			Free Product	
	3/92			Free Product	
	12/91			Free Product	
	9/91			Free Product	
	6/91	1040	330	700	1230
	3/91	900	250	650	2000
	12/90	2100g	100g	1300g	2300g
	9/90	170	140	110	270
	6/90	34	110	24	190
	3/90	310	140	140	280
	12/89	270	180	180	560
	9/89	990	200	550	850
	6/89	600	630	340	1200
	3/89	400	360	190	750
	12/88	1500	380	570	960
	9/88	800	300	280	910
	6/88	600	340	140	600
MW-504	12/94	5800	840	700	7600
	9/94			Free Product	
	6/94	8600	<500	2100	8100
	3/94			Free Product	
	12/93	11000	1800	1300	9200
	9/93			Free Product	
	5/93			Free Product	
	3/93			Free Product	
	12/92			Free Product	
	9/92			Free Product	
	6/92			Free Product	
	3/92			Free Product	
	12/91	NA	NA	NA	NA
	9/91	NA	NA	NA	NA
	6/91			Free Product	
	3/91			Well damaged; interface probe reached bottom ~98 feet bgs. <sup>h</sup>	
	12/90			Free Product	
	9/90			i	
	6/90			Free Product	
	3/90			Free Product	
	12/89			Free Product	

TABLE B-2. Continued.

Well No.	Date Sampled	Benzene ( $\mu\text{g/L}$ ) <sup>b</sup>	Ethylbenzene ( $\mu\text{g/L}$ )	Toluene ( $\mu\text{g/L}$ )	Total Xylenes ( $\mu\text{g/L}$ )
MW-600	12/94		Free Product		
	9/94		Free Product		
	6/94		Free Product		
	3/94		Free Product		
	12/93		Free Product		
	9/93		Free Product		
	5/93		Free Product		
	3/93		Free Product		
	12/92		Free Product		
	9/92		Free Product		
	6/92		Free Product		
	3/92		Free Product		
	12/91		Free Product		
	9/91		Free Product		
	6/91		Free Product		
	3/91		Free Product		
	12/90		Free Product		
	9/90		Free Product		
MW-601	12/94		Free Product		
	9/94		Free Product		
	6/94		Free Product		
	3/94		Free Product		
	12/93		Free Product		
	9/93		Free Product		
	5/93		Free Product		
	3/93		Free Product		
	12/92		Free Product		
	9/92		Free Product		
	6/92		Free Product		
	3/92		Free Product		
	12/91		Free Product		
	9/91		Free Product		
	6/91		Free Product		
	3/91		Free Product		
	12/90		Free Product		
	9/90		Free Product		
Trip Blank	12/94	<5	<5	<5	<5
	9/94	<5	<5	<5	<5
	3/94	<5	<5	<5	<5
	11/93	<5	<5	<5	<5
	9/93	<5	<5	<5	<5
	5/93	<5	<5	<5	<5

TABLE B-2. Continued.

Well No.	Date Sampled	Benzene ( $\mu\text{g/L}$ ) <sup>b</sup>	Ethylbenzene ( $\mu\text{g/L}$ )	Toluene ( $\mu\text{g/L}$ )	Total Xylenes ( $\mu\text{g/L}$ )
Trip Blank	3/93	≤5	≤5	≤5	≤5
(Con't)	12/92	≤5	≤5	≤5	≤5
	9/92	≤5	≤5	≤5	≤5
	6/92	≤5	≤5	≤5	≤5
	3/92	≤5	≤5	≤5	≤5
	12/91	≤5	≤5	≤5	≤5
	9/91	≤5	≤5	≤5	≤5
	6/91	≤5	≤5	≤5	≤5
	3/91	≤5	≤5	≤5	≤5
Field Blank	12/94	≤5	≤5	≤5	≤5
	9/94	≤5	≤5	≤5	≤5
	3/94	≤5	≤5	≤5	≤5
	11/93	≤5	≤5	≤5	≤5
	9/93	≤5	≤5	≤5	≤5
	5/93	≤5	≤5	≤5	≤5
	3/93	≤5	≤5	≤5	≤5
	12/92	≤5	≤5	≤5	≤5
	9/92	≤5	≤5	≤5	≤5
	6/92	≤5	≤5	≤5	≤5
	3/92	≤5	≤5	≤5	≤5
	12/91	≤5	≤5	≤5	≤5
	9/91	≤5	≤5	≤5	≤5
	6/91	≤5	≤5	≤5	≤5
	3/91	≤5	≤5	≤5	≤5

a Latest samples collected December 15-16, 1994 by AeroVironment Inc.; all data prior to March 1991 collected and reported by ENSR

b  $\mu\text{g/L}$  = micrograms per liter = parts per billion

c NA = not applicable (well dry or insufficient water to sample)

d Original concentration was out of the detection range; second run was performed at 1:5 dilution

e Because of sample concentration, a 1:10 dilution was used

f Because of sample concentration, a 1:50 dilution was used

g Because of sample concentration, a 1:100 dilution was used

h bgs = below ground surface

i Access to well restricted

() Analysis in parenthesis run at ENSECO-CRL Laboratory

**TABLE B-3. Summary of groundwater sample analytical results by EPA Method 601.  
(AeroVironment Inc., 1994)<sup>a</sup>**

Well No.	Date Sampled	1,2-Dichloroethane (µg/L) <sup>b</sup>	1,1-Dichloroethane (µg/L)	1,1-Dichloroethene (µg/L)	Cis-1,2-Dichloroethene (µg/L)	Trans-1,2-Dichloroethene (µg/L)	Trichloroethene (µg/L)	Tetrachloroethene (µg/L)	1,1,1-Trichloroethane
Analytical Method Detection Limit		0.5	0.5	2.0	0.5	0.5	0.5	0.5	1.0
MW-101	12/94	1.7	13	250	43	1.2	240	95	1.6
MW-103	12/94	1.2	<0.5	<2.0	0.9	<0.5	<0.5	<0.5	<1.0
MW-104	12/94	<0.5	<0.5	<2.0	<0.5	<0.5	<0.5	<0.5	<1.0
MW-201	12/94	5.1 <sup>c</sup>	14 <sup>c</sup>	15.0 <sup>c</sup>	59 <sup>c</sup>	<5 <sup>c</sup>	84 <sup>c</sup>	21 <sup>c</sup>	<1.0 <sup>c</sup>
MW-202	12/94				Free Product				
MW-203	12/94	<0.5	<0.5	<0.2	44	4.3	<0.5	<0.5	<1.0
MW-204	12/94	9.8 <sup>c</sup>	<0.5 <sup>c</sup>	<20 <sup>c</sup>	<5 <sup>c</sup>	<5 <sup>c</sup>	<5 <sup>c</sup>	<5 <sup>c</sup>	<10 <sup>c</sup>
MW-205	12/94	2.9	21	96	53	4.4	180	37	<1.0
MW-206	12/94	20 <sup>c</sup>	<0.5 <sup>c</sup>	<20 <sup>c</sup>	<0.5 <sup>c</sup>	<0.5 <sup>c</sup>	<0.5 <sup>c</sup>	<0.5 <sup>c</sup>	<10 <sup>c</sup>
MW-501	12/94				Free Product				
MW-502	12/94	34 <sup>c</sup>	<5.0 <sup>c</sup>	<20 <sup>c</sup>	<5.0 <sup>c</sup>	<5.0 <sup>c</sup>	<5.0 <sup>c</sup>	<5.0 <sup>c</sup>	<10 <sup>c</sup>
MW-503	12/94	<5 <sup>c</sup>	28 <sup>c</sup>	183 <sup>c</sup>	27 <sup>c</sup>	<5.0 <sup>c</sup>	130 <sup>c</sup>	68 <sup>c</sup>	<10 <sup>c</sup>
MW-504	12/94	<5.0	<5.0 <sup>c</sup>	<20	6.6	<5.0 <sup>c</sup>	29	<5.0 <sup>c</sup>	<10 <sup>c</sup>
MW-600	12/94				Free Product				
MW-601	12/94				Free Product				
Trip Blank	12/94	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<0.5	<1.0
Field Blank	12/94	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<0.5	<1.0

<sup>a</sup> All samples collected December 15-16, 1994

<sup>b</sup> µg/L = micrograms per liter = parts per billion

<sup>c</sup> Sample was diluted at a ratio of 1:10

**Appendix C**

**CHAIN-OF-CUSTODY FORMS AND LABORATORY ANALYSIS RESULTS**

## CHAIN-OF-CUSTODY RECORD

**AeroVironment Inc.**

222 East Huntington Drive, P.O. Box 5031  
 Monrovia, California 91017-7131  
 Telephone 818/357-9983  
 FAX 818/359-9628

Send report to the attention of: STUART M. BERKE

No 0856

AV Project No. \_\_\_\_\_

P.O. # \_\_\_\_\_

Sampled by STUART M. BERKE / KEN JONIUS

Lab Sample Number	AV Sample Number	Date sampled	Time sampled	Type* see key below	Number of containers	Analyses Required										Hazardous sample Special handling required	Remarks	
						Halogen Volatiles 601/8010	Aromatic Volatiles 601/8020	Purgeables GC/MS 624/8240	TPH 418.1	TPFH Modified 8015	Base/Neutral/Acids GC/MS 625/8270	Pesticides/PCB 608/8080						
L943859-1	TRIP BLANK	12/19/94	0700	AQ	2	X		X										
2	MW-104		0951															
3	MW-205		1054															
4	MW-101		1116															
5	MW-201		1212															
6	MW-203		1343															
7	MW-103		1405															
8	MW-502	12/19/94	0947															
9	FIELD BLANK		0155															(i.e EQUIPMENT RINSE)
10	MW-503		1053															
11	MW-206		1254															

Signature

Print Name

Company

Date

Time

Relinquished by

Stuart J.STUART M. BERKEAEROVIRONMENT

12/19/94 0745

## \*KEY

AQ-Aqueous

NA-Nonaqueous

SL-Sludge

GW-Groundwater

SO-Soil

OT-Other

PE-Petroleum

Received by

Relinquished by

Received by

Relinquished by

Received by Laboratory

M. SigmaGS/CAS

12-19-94 0745





December 28, 1994

Stuart Berge  
AeroVironment Inc.  
222 East Huntington Dr., P.O. Box 5031  
Monrovia, CA 91017-7131

Re: **Santa Fe Springs**

Dear Stuart:

Enclosed are the results of the samples submitted to our lab on December 19, 1994. For your reference, these analyses have been assigned our service request number L943859.

All analyses were performed in accordance with our laboratory's quality assurance program. Golden State / CAS is certified for environmental analyses by the California Department of Health Services (Certificate # 1296/Expiration - August 1996).

Please call if you have any questions.

Respectfully submitted,

**Golden State / CAS Laboratories, Inc.**

*Eydie Schwartz*

Eydie H. Schwartz  
Project Chemist

ES/sjt

**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client:** AeroVironment, Inc.  
**Project:** Santa Fe Springs  
**Sample Matrix:** Aqueous

**Service Request:** L943859  
**Date Collected:** 12/15/94  
**Date Received:** 12/19/94  
**Date Extracted:** NA

**Volatile Organic Compounds**  
**EPA Method 624**  
**Units: µg/L (ppb)**

<b>Sample Name:</b>	<b>TRIP BLANK</b>	<b>MW-104</b>	<b>MW-205</b>
<b>Lab Code:</b>	L943859-001	L943859-002	L943859-003
<b>Date Analyzed:</b>	12/20/94	12/20/94	12/20/94

Analyte	MRL
Chloromethane	10
Vinyl Chloride	10
Bromomethane	10
Chloroethane	10
Trichlorofluoromethane (Freon 11)	5
1,1-Dichloroethene	5
Acetone	50
Carbon Disulfide	5
Methylene Chloride	10
trans-1,2-Dichloroethene	5
cis-1,2-Dichloroethene	5
2-Butanone (MEK)	10
1,1-Dichloroethane	5
Chloroform	5
1,1,1-Trichloroethane (TCA)	5
Carbon Tetrachloride	5
Benzene	5
1,2-Dichloroethane	5
Vinyl Acetate	10
Trichloroethene (TCE)	5
Bromodichloromethane	5
2-Chloroethyl Vinyl Ether	10
trans-1,3-Dichloropropene	5
2-Hexanone	10
4-Methyl-2-pentanone (MIBK)	10
Toluene	5
cis-1,3-Dichloropropene	5
1,1,2-Trichloroethane	5
Tetrachloroethene (PCE)	5
Dibromochloromethane	5
Chlorobenzene	5
Ethylbenzene	5
Styrene	5
Total Xylenes	5
Bromoform	5
1,1,2,2-Tetrachloroethane	5
1,3-Dichlorobenzene	5
1,4-Dichlorobenzene	5
1,2-Dichlorobenzene	5
1,2-Dichloropropane	5

**NA** Not Applicable  
**MRL** Method Reporting Limit.  
**ND** None Detected at or above the method reporting limit.

Approved By:

*Eydie Schwartz*

Date: 12/28/94

3S44/060194

L943859.XLS - B240s 12/28/94  
 6925 CANOGA AVENUE

CANOGA PARK, CA 91303

818 587-5550

FAX 818 587-5555

Page No.:

## COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Report

**Client:** AeroVironment, Inc.  
**Project:** Santa Fe Springs  
**Sample Matrix:** Aqueous

**Service Request:** L943859  
**Date Collected:** 12/15/94  
**Date Received:** 12/19/94  
**Date Extracted:** NA

Volatile Organic Compounds  
EPA Method 624  
Units: µg/L (ppb)

	Sample Name: Lab Code: Date Analyzed:	MW-101 L943859-004 12/20/94	MW-204 L943859-005* 12/20/94	MW-203 L943859-006 12/20/94
--	---------------------------------------------	-----------------------------------	------------------------------------	-----------------------------------

Analyte	MRL	ND	<100	ND
Chloromethane	10	ND	<100	ND
Vinyl Chloride	10	ND	<100	ND
Bromomethane	10	ND	<100	ND
Chloroethane	10	ND	<100	ND
Trichlorofluoromethane (Freon 11)	5	ND	<50	ND
1,1-Dichloroethene	5	130	<50	ND
Acetone	50	ND	<500	ND
Carbon Disulfide	5	ND	<50	ND
Methylene Chloride	10	ND	<100	ND
trans-1,2-Dichloroethene	5	ND	<50	ND
cis-1,2-Dichloroethene	5	51	<50	53
2-Butanone (MEK)	10	ND	<100	ND
1,1-Dichloroethane	5	14	<50	ND
Chloroform	5	ND	<50	ND
1,1,1-Trichloroethane (TCA)	5	ND	<50	ND
Carbon Tetrachloride	5	ND	<50	ND
Benzene	5	62	5500	39
1,2-Dichloroethane	5	ND	<50	ND
Vinyl Acetate	10	ND	<100	ND
Trichloroethene (TCE)	5	210	<50	ND
Bromodichloromethane	5	ND	<50	ND
2-Chloroethyl Vinyl Ether	10	ND	<100	ND
trans-1,3-Dichloropropene	5	ND	<50	ND
2-Hexanone	10	ND	<100	ND
4-Methyl-2-pentanone (MIBK)	10	ND	<100	ND
Toluene	5	ND	630	ND
cis-1,3-Dichloropropene	5	ND	<50	ND
1,1,2-Trichloroethane	5	ND	<50	ND
Tetrachloroethene (PCE)	5	85	<50	ND
Dibromochloromethane	5	ND	<50	ND
Chlorobenzene	5	ND	<50	ND
Ethylbenzene	5	6	190	ND
Styrene	5	ND	<50	ND
Total Xylenes	5	ND	990	ND
Bromoform	5	ND	<50	ND
1,1,2,2-Tetrachloroethane	5	ND	<50	ND
1,3-Dichlorobenzene	5	ND	<50	ND
1,4-Dichlorobenzene	5	ND	<50	ND
1,2-Dichlorobenzene	5	ND	<50	ND
1,2-Dichloropropane	5	ND	<50	ND

**NA** Not Applicable

**MRL** Method Reporting Limit.

**ND** None Detected at or above the method reporting limit.

\* MRL is elevated because of matrix interferences and because the sample required diluting.

Approved By: Eugie Schwartz

Date: 12/28/94

3S44/060194

**COLUMBIA ANALYTICAL SERVICES, INC.**

**Analytical Report**

**Client:** AeroVironment, Inc.  
**Project:** Santa Fe Springs  
**Sample Matrix:** Aqueous

**Service Request:** L943859  
**Date Collected:** 12/15/94  
**Date Received:** 12/19/94  
**Date Extracted:** NA

**Volatile Organic Compounds**  
**EPA Method 624**  
**Units: µg/L (ppb)**

**Sample Name:** MW-103  
**Lab Code:** L943859-007\*  
**Date Analyzed:** 12/20/94

<b>Analyte</b>	<b>MRL</b>	
Chloromethane	10	<20
Vinyl Chloride	10	<20
Bromomethane	10	<20
Chloroethane	10	<20
Trichlorofluoromethane (Freon 11)	5	<10
1,1-Dichloroethene	5	<10
Acetone	50	<100
Carbon Disulfide	5	<10
Methylene Chloride	10	<20
trans-1,2-Dichloroethene	5	<10
cis-1,2-Dichloroethene	5	<10
2-Butanone (MEK)	10	<20
1,1-Dichloroethane	5	<10
Chloroform	5	<10
1,1,1-Trichloroethane (TCA)	5	<10
Carbon Tetrachloride	5	<10
Benzene	5	240
1,2-Dichloroethane	5	<10
Vinyl Acetate	10	<20
Trichloroethene (TCE)	5	<10
Bromodichloromethane	5	<10
2-Chloroethyl Vinyl Ether	10	<20
trans-1,3-Dichloropropene	5	<10
2-Hexanone	10	<20
4-Methyl-2-pentanone (MIBK)	10	<20
Toluene	5	<10
cis-1,3-Dichloropropene	5	<10
1,1,2-Trichloroethane	5	<10
Tetrachloroethene (PCE)	5	<10
Dibromochloromethane	5	<10
Chlorobenzene	5	<10
Ethylbenzene	5	<10
Styrene	5	<10
Total Xylenes	5	11
Bromoform	5	<10
1,1,2,2-Tetrachloroethane	5	<10
1,3-Dichlorobenzene	5	<10
1,4-Dichlorobenzene	5	<10
1,2-Dichlorobenzene	5	<10
1,2-Dichloropropane	5	<50

**NA** Not Applicable

**MRL** Method Reporting Limit.

**ND** None Detected at or above the method reporting limit.

\* MRL is elevated because of matrix interferences and because the sample required diluting.

Approved By: Eydie Schwartz

Date: 12/28/94

3S44/060194

## COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Report

**Client:** AeroVironment, Inc.  
**Project:** Santa Fe Springs  
**Sample Matrix:** Aqueous

**Service Request:** L943859  
**Date Collected:** 12/16/94  
**Date Received:** 12/19/94  
**Date Extracted:** NA

Volatile Organic Compounds  
EPA Method 624  
Units: µg/L (ppb)

Sample Name: Lab Code: Date Analyzed:	MW-502 L943859-008*	FIELD BLANK L943859-009 12/21/94	MW-503 L943859-010 12/21/94
---------------------------------------------	------------------------	----------------------------------------	-----------------------------------

Analyte	MRL			
Chloromethane	10	<100	ND	ND
Vinyl Chloride	10	<100	ND	ND
Bromomethane	10	<100	ND	ND
Chloroethane	10	<100	ND	ND
Trichlorofluoromethane (Freon 11)	5	<50	ND	ND
1,1-Dichloroethene	5	<50	ND	200
Acetone	50	<500	ND	ND
Carbon Disulfide	5	<50	ND	ND
Methylene Chloride	10	<100	ND	ND
trans-1,2-Dichloroethene	5	<50	ND	ND
cis-1,2-Dichloroethene	5	<50	ND	32
2-Butanone (MEK)	10	<100	ND	ND
1,1-Dichloroethane	5	<50	ND	20
Chloroform	5	<50	ND	ND
1,1,1-Trichloroethane (TCA)	5	<50	ND	ND
Carbon Tetrachloride	5	<50	ND	ND
Benzene	5	8400	ND	240
1,2-Dichloroethane	5	<50	ND	ND
Vinyl Acetate	10	<100	ND	ND
Trichloroethene (TCE)	5	<50	ND	150
Bromodichloromethane	5	<50	ND	ND
2-Chloroethyl Vinyl Ether	10	<100	ND	ND
trans-1,3-Dichloropropene	5	<50	ND	ND
2-Hexanone	10	<100	ND	ND
4-Methyl-2-pentanone (MIBK)	10	<100	ND	ND
Toluene	5	1600	ND	22
cis-1,3-Dichloropropene	5	<50	ND	ND
1,1,2-Trichloroethane	5	<50	ND	ND
Tetrachloroethene (PCE)	5	<50	ND	83
Dibromochloromethane	5	<50	ND	ND
Chlorobenzene	5	<50	ND	ND
Ethylbenzene	5	1600	ND	66
Styrene	5	<50	ND	ND
Total Xylenes	5	6000	ND	79
Bromoform	5	<50	ND	ND
1,1,2,2-Tetrachloroethane	5	<50	ND	ND
1,3-Dichlorobenzene	5	<50	ND	ND
1,4-Dichlorobenzene	5	<50	ND	ND
1,2-Dichlorobenzene	5	<50	ND	ND
1,2-Dichloropropane	5	<50	ND	ND

**NA**

Not Applicable

**MRL**

Method Reporting Limit.

**ND**

None Detected at or above the method reporting limit.

**\***

MRL is elevated because of matrix interferences and because the sample required diluting.

Approved By:

*Eydie Schwartz*Date: 12/28/94

3S44/060194

**COLUMBIA ANALYTICAL SERVICES, INC.**

**Analytical Report**

**Client:** AeroVironment, Inc.  
**Project:** Santa Fe Springs  
**Sample Matrix:** Aqueous

**Service Request:** L943859  
**Date Collected:** 12/16/94  
**Date Received:** 12/19/94  
**Date Extracted:** NA

**Volatile Organic Compounds**  
**EPA Method 624**  
**Units: µg/L (ppb)**

<b>Sample Name:</b>	<b>MW-206 (12:04)</b>	<b>MW-504</b>
<b>Lab Code:</b>	L943859-011*	L943859-012*
<b>Date Analyzed:</b>	12/21/94	12/21/94

<b>Analyte</b>	<b>MRL</b>		
Chloromethane	10	<100	<100
Vinyl Chloride	10	<100	<100
Bromomethane	10	<100	<100
Chloroethane	10	<100	<100
Trichlorofluoromethane (Freon 11)	5	<50	<50
1,1-Dichloroethene	5	<50	<50
Acetone	50	<500	<500
Carbon Disulfide	5	<50	<50
Methylene Chloride	10	<100	<100
trans-1,2-Dichloroethene	5	<50	<50
cis-1,2-Dichloroethene	5	<50	<50
2-Butanone (MEK)	10	<100	<100
1,1-Dichloroethane	5	<50	<50
Chloroform	5	<50	<50
1,1,1-Trichloroethane (TCA)	5	<50	<50
Carbon Tetrachloride	5	<50	<50
Benzene	5	8400	5800
1,2-Dichloroethane	5	<50	<50
Vinyl Acetate	10	<100	<100
Trichloroethene (TCE)	5	<50	<50
Bromodichloromethane	5	<50	<50
2-Chloroethyl Vinyl Ether	10	<100	<100
trans-1,3-Dichloropropene	5	<50	<50
2-Hexanone	10	<100	<100
4-Methyl-2-pentanone (MIBK)	10	<100	<100
Toluene	5	4900	700
cis-1,3-Dichloropropene	5	<50	<50
1,1,2-Trichloroethane	5	<50	<50
Tetrachloroethene (PCE)	5	<50	<50
Dibromochloromethane	5	<50	<50
Chlorobenzene	5	<50	<50
Ethylbenzene	5	1800	840
Styrene	5	<50	<50
Total Xylenes	5	9500	7600
Bromoform	5	<50	<50
1,1,2,2-Tetrachloroethane	5	<50	<50
1,3-Dichlorobenzene	5	<50	<50
1,4-Dichlorobenzene	5	<50	<50
1,2-Dichlorobenzene	5	<50	<50
1,2-Dichloropropane	5	<50	<50

**NA**

Not Applicable

**MRL**

Method Reporting Limit.

**ND**

None Detected at or above the method reporting limit.

\*

MRL is elevated because of matrix interferences and because the sample required diluting.

Approved By:

*Eugie Schwartz*

Date: *12/28/94*

3S44/060194

L943859.XLS - 8240s (5) 12/28/94  
 6925 CANOGA AVENUE

CANOGA PARK, CA 91303

818 587-5550

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Page No.:

## COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Report

**Client:** AeroVironment, Inc.  
**Project:** Santa Fe Springs  
**Sample Matrix:** Aqueous

**Service Request:** L943859  
**Date Collected:** 12/16/94  
**Date Received:** 12/19/94  
**Date Extracted:** NA

Volatile Organic Compounds  
EPA Method 624  
Units:  $\mu\text{g/L}$  (ppb)

2015m<sup>6</sup>

Sample Name:	MW-206 (14:36)	Method Blank
Lab Code:	L943859-013*	L943859-MB
Date Analyzed:	12/20/94	12/20/94

Analyte	MRL		
Chloromethane	10	<20	ND
Vinyl Chloride	10	<20	ND
Bromomethane	10	<20	ND
Chloroethane	10	<20	ND
Trichlorofluoromethane (Freon 11)	5	<10	ND
1,1-Dichloroethene	5	150	ND
Acetone	50	<100	ND
Carbon Disulfide	5	<10	ND
Methylene Chloride	10	<20	ND
trans-1,2-Dichloroethene	5	<10	ND
cis-1,2-Dichloroethene	5	78	ND
2-Butanone (MEK)	10	<20	ND
1,1-Dichloroethane	5	<10	ND
Chloroform	5	<10	ND
1,1,1-Trichloroethane (TCA)	5	<10	ND
Carbon Tetrachloride	5	<10	ND
Benzene	5	1300	ND
1,2-Dichloroethane	5	<10	ND
Vinyl Acetate	10	<20	ND
Trichloroethene (TCE)	5	80	ND
Bromodichloromethane	5	<10	ND
2-Chloroethyl Vinyl Ether	10	<20	ND
trans-1,3-Dichloropropene	5	<10	ND
2-Hexanone	10	<20	ND
4-Methyl-2-pentanone (MIBK)	10	<20	ND
Toluene	5	66	ND
cis-1,3-Dichloropropene	5	<10	ND
1,1,2-Trichloroethane	5	<10	ND
Tetrachloroethene (PCE)	5	25	ND
Dibromochloromethane	5	<10	ND
Chlorobenzene	5	<10	ND
Ethylbenzene	5	500	ND
Styrene	5	<10	ND
Total Xylenes	5	560	ND
Bromoform	5	<10	ND
1,1,2,2-Tetrachloroethane	5	<10	ND
1,3-Dichlorobenzene	5	<10	ND
1,4-Dichlorobenzene	5	<10	ND
1,2-Dichlorobenzene	5	<10	ND
1,2-Dichloropropane	5	<10	ND

NA

Not Applicable

MRL

Method Reporting Limit.

ND

None Detected at or above the method reporting limit.

\*

MRL is elevated because of matrix interferences and because the sample required diluting.

Approved By:

*Eypie Schwartz*Date: 12/28/94

3S44/060194

## COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Report

**Client:** AeroVironment, Inc.  
**Project:** Santa Fe Springs  
**Sample Matrix:** Aqueous

**Service Request:** L943859  
**Date Collected:** 12/15/94  
**Date Received:** 12/19/94  
**Date Extracted:** NA

Halogenated Volatile Organic Compounds  
EPA Methods 601  
Units: µg/L (ppb)

Sample Name:	TRIP BLANK	MW-104	MW-205
Lab Code:	L943859-001	L943859-002	L943859-003
Date Analyzed:	12/20/94	12/20/94	12/20/94

Analyte	MRL	TRIP BLANK	MW-104	MW-205
Dichlorodifluoromethane (Freon 12)	5	ND	ND	ND
Chloromethane	5	ND	ND	ND
Vinyl Chloride	5	ND	ND	ND
Bromomethane	5	ND	ND	ND
Chloroethane	5	ND	ND	ND
Trichlorodifluoromethane (Freon 11)	0.5	ND	ND	ND
1,1-Dichloroethene	2	ND	ND	96
Methylene Chloride	2	ND	ND	ND
<i>trans</i> -1,2-Dichloroethene	0.5	ND	ND	4.4
<i>cis</i> -1,2-Dichloroethene	0.5	ND	ND	53
1,1-Dichloroethane	0.5	ND	ND	21
Chloroform	0.5	ND	ND	ND
1,1,1-Trichloroethane (TCA)	1	ND	ND	ND
Carbon Tetrachloride	0.5	ND	ND	ND
1,2-Dichloroethane	0.5	ND	ND	2.9
Trichloroethene (TCE)	0.5	ND	ND	180
1,2-Dichloropropane	0.5	ND	ND	ND
Bromodichloromethane	0.5	ND	ND	ND
2-Chloroethyl Vinyl Ether	5	ND	ND	ND
<i>trans</i> -1,3-Dichloropropene	0.5	ND	ND	ND
<i>cis</i> -1,3-Dichloropropene	0.5	ND	ND	ND
1,1,2-Trichloroethane	0.5	ND	ND	ND
Tetrachloroethene (PCE)	0.5	ND	ND	37
Dibromochloromethane	0.5	ND	ND	ND
Chlorobenzene	0.5	ND	ND	ND
Bromoform	0.5	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.5	ND	ND	ND
1,3-Dichlorobenzene	1	ND	ND	ND
1,4-Dichlorobenzene	1	ND	ND	ND
1,2-Dichlorobenzene	1	ND	ND	ND

**NA**

Not Applicable

**MRL**

Method Reporting Limit.

**ND**

None Detected at or above the method reporting limit.

Approved By:

*Eydie Schwartz*Date: 12/28/94

3S44/060194

## COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Report

**Client:** AeroVironment, Inc.  
**Project:** Santa Fe Springs  
**Sample Matrix:** Aqueous

**Service Request:** L943859  
**Date Collected:** 12/15/94  
**Date Received:** 12/19/94  
**Date Extracted:** NA

Halogenated Volatile Organic Compounds  
EPA Methods 601  
Units: µg/L (ppb)

	Sample Name: Lab Code: Date Analyzed:	MW-101 L943859-004 12/20/94	MW-204 L943859-005* 12/20/94	MW-203 L943859-006 12/21/94
--	---------------------------------------------	-----------------------------------	------------------------------------	-----------------------------------

Analyte	MRL			
Dichlorodifluoromethane (Freon 12)	5	ND	10	ND
Chloromethane	5	ND	<50	ND
Vinyl Chloride	5	ND	<50	ND
Bromomethane	5	ND	<50	ND
Chloroethane	5	ND	<50	ND
Trichlorodifluoromethane (Freon 11)	0.5	ND	<5	ND
1,1-Dichloroethene	2	250	<20	ND
Methylene Chloride	2	ND	<20	ND
trans -1,2-Dichloroethene	0.5	1.2	<5	4.3
cis -1,2-Dichloroethene	0.5	43	<5	44
1,1-Dichloroethane	0.5	13	<5	ND
Chloroform	0.5	ND	<5	ND
1,1,1-Trichloroethane (TCA)	1	1.6	<10	ND
Carbon Tetrachloride	0.5	ND	<5	ND
1,2-Dichloroethane	0.5	1.7	9.8	ND
Trichloroethene (TCE)	0.5	240	<5	ND
1,2-Dichloropropane	0.5	ND	<5	ND
Bromodichloromethane	0.5	ND	<5	ND
2-Chloroethyl Vinyl Ether	5	ND	<50	ND
trans -1,3-Dichloropropene	0.5	ND	<5	ND
cis -1,3-Dichloropropene	0.5	ND	<5	ND
1,1,2-Trichloroethane	0.5	ND	<5	ND
Tetrachloroethene (PCE)	0.5	95	<5	ND
Dibromochloromethane	0.5	ND	<5	ND
Chlorobenzene	0.5	ND	<5	ND
Bromoform	0.5	ND	<5	ND
1,1,2,2-Tetrachloroethane	0.5	ND	<5	ND
1,3-Dichlorobenzene	1	ND	<10	ND
1,4-Dichlorobenzene	1	ND	<10	ND
1,2-Dichlorobenzene	1	ND	<10	ND

**NA**

Not Applicable

**MRL**

Method Reporting Limit.

**ND**

None Detected at or above the method reporting limit.

**\***

MRL is elevated because the sample required diluting.

Approved By:

*Eydie Schwartz*Date: *12/28/94*

3544/060194

**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client:** AeroVironment, Inc.  
**Project:** Santa Fe Springs  
**Sample Matrix:** Aqueous

**Service Request:** L943859  
**Date Collected:** 12/15/94  
**Date Received:** 12/19/94  
**Date Extracted:** NA

**Halogenated Volatile Organic Compounds**  
**EPA Methods 601**  
**Units: µg/L (ppb)**

Sample Name: **MW-103**  
Lab Code: L943859-007  
Date Analyzed: 12/21/94

<b>Analyte</b>	<b>MRL</b>
Dichlorodifluoromethane (Freon 12)	5
Chloromethane	5
Vinyl Chloride	5
Bromomethane	5
Chloroethane	5
Trichlorofluoromethane (Freon 11)	0.5
1,1-Dichloroethene	2
Methylene Chloride	2
<i>trans</i> -1,2-Dichloroethene	0.5
<i>cis</i> -1,2-Dichloroethene	0.5
1,1-Dichloroethane	0.5
Chloroform	0.5
1,1,1-Trichloroethane (TCA)	1
Carbon Tetrachloride	0.5
1,2-Dichloroethane	0.5
Trichloroethene (TCE)	0.5
1,2-Dichloropropane	0.5
Bromodichloromethane	0.5
2-Chloroethyl Vinyl Ether	5
<i>trans</i> -1,3-Dichloropropene	0.5
<i>cis</i> -1,3-Dichloropropene	0.5
1,1,2-Trichloroethane	0.5
Tetrachloroethene (PCE)	0.5
Dibromochloromethane	0.5
Chlorobenzene	0.5
Bromoform	0.5
1,1,2,2-Tetrachloroethane	0.5
1,3-Dichlorobenzene	1
1,4-Dichlorobenzene	1
1,2-Dichlorobenzene	1

**NA**  
**MRL**  
**ND**

Not Applicable  
Method Reporting Limit.  
None Detected at or above the method reporting limit.

Approved By:

*Eydie Schwartz*

Date: 12/28/94

3S44/060194

L943859.XLS - 8010w (3) 12/28/94  
6925 CANOGA AVENUE

CANOGA PARK, CA 91303

818 587-5550

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Page No.:

## COLUMBIA ANALYTICAL SERVICES, INC.

## Analytical Report

Client: AeroVironment, Inc.  
 Project: Santa Fe Springs  
 Sample Matrix: Aqueous

Service Request: L943859  
 Date Collected: 12/15/94  
 Date Received: 12/19/94  
 Date Extracted: NA

Halogenated Volatile Organic Compounds  
 EPA Methods 601  
 Units: µg/L (ppb)

Analyte	MRL	Sample Name: Lab Code: Date Analyzed:	MW-502 L943859-008* 12/20/94	FIELD BLANK L943859-009 12/20/94	MW-503 L943859-010* 12/20/94
Dichlorodifluoromethane (Freon 12)	5		<50	ND	<50
Chloromethane	5		<50	ND	<50
Vinyl Chloride	5		<50	ND	<50
Bromomethane	5		<50	ND	<50
Chloroethane	5		<50	ND	<50
Trichlorofluoromethane (Freon 11)	0.5		<5	ND	<5
1,1-Dichloroethene	2		<20	ND	183
Methylene Chloride	2		<20	ND	<20
trans-1,2-Dichloroethene	0.5		<5	ND	<5
cis-1,2-Dichloroethene	0.5		<5	ND	27
1,1-Dichloroethane	0.5		<5	ND	28
Chloroform	0.5		<5	ND	<5
1,1,1-Trichloroethane (TCA)	1		<10	ND	<10
Carbon Tetrachloride	0.5		<5	ND	<5
1,2-Dichloroethane	0.5		34	ND	<5
Trichloroethene (TCE)	0.5		<5	ND	130
1,2-Dichloropropane	0.5		<5	ND	<5
Bromodichloromethane	0.5		<5	ND	<5
2-Chloroethyl Vinyl Ether	5		<50	ND	<50
trans-1,3-Dichloropropene	0.5		<5	ND	<5
cis-1,3-Dichloropropene	0.5		<5	ND	<5
1,1,2-Trichloroethane	0.5		<5	ND	<5
Tetrachloroethene (PCE)	0.5		<5	ND	68
Dibromochloromethane	0.5		<5	ND	<5
Chlorobenzene	0.5		<5	ND	<5
Bromoform	0.5		<5	ND	<5
1,1,2,2-Tetrachloroethane	0.5		<5	ND	<5
1,3-Dichlorobenzene	1		<10	ND	<10
1,4-Dichlorobenzene	1		<10	ND	<10
1,2-Dichlorobenzene	1		<10	ND	<10

NA

Not Applicable

MRL

Method Reporting Limit.

ND

None Detected at or above the method reporting limit.

\*

MRL is elevated because the sample required diluting.

Approved By:

Eydie SchwartzDate: 12/28/94

3S44/060194

L943859.XLS - 8010w (4) 12/28/94  
6925 CANOGA AVENUE

CANOGA PARK, CA 91303

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Page No.:

**COLUMBIA ANALYTICAL SERVICES, INC.**

**Analytical Report**

**Client:** AeroVironment, Inc.  
**Project:** Santa Fe Springs  
**Sample Matrix:** Aqueous

**Service Request:** L943859  
**Date Collected:** 12/15/94  
**Date Received:** 12/19/94  
**Date Extracted:** NA

**Halogenated Volatile Organic Compounds**  
**EPA Methods 601**  
**Units: µg/L (ppb)**

<b>Sample Name:</b>	<b>MW-206 (12:04)</b>	<b>MW-504</b>
<b>Lab Code:</b>	L943859-011*	L943859-012*
<b>Date Analyzed:</b>	12/20/94	12/20/94

**Analyte**                    **MRL**

Dichlorodifluoromethane (Freon 12)	5	<50	<50
Chloromethane	5	<50	<50
Vinyl Chloride	5	<50	<50
Bromomethane	5	<50	<50
Chloroethane	5	<50	<50
Trichlorofluoromethane (Freon 11)	0.5	<5	<5
1,1-Dichloroethene	2	<20	<20
Methylene Chloride	2	<20	<20
<i>trans</i> -1,2-Dichloroethene	0.5	<5	<5
<i>cis</i> -1,2-Dichloroethene	0.5	<5	6.6
1,1-Dichloroethane	0.5	<5	<5
Chloroform	0.5	<5	<5
1,1,1-Trichloroethane (TCA)	1	<10	<10
Carbon Tetrachloride	0.5	<5	<5
1,2-Dichloroethane	0.5	20	<5
Trichloroethene (TCE)	0.5	<5	29
1,2-Dichloropropane	0.5	<5	<5
Bromodichloromethane	0.5	<5	<5
2-Chloroethyl Vinyl Ether	5	<50	<50
<i>trans</i> -1,3-Dichloropropene	0.5	<5	<5
<i>cis</i> -1,3-Dichloropropene	0.5	<5	<5
1,1,2-Trichloroethane	0.5	<5	<5
Tetrachloroethene (PCE)	0.5	<5	<5
Dibromochloromethane	0.5	<5	<5
Chlorobenzene	0.5	<5	<5
Bromoform	0.5	<5	<5
1,1,2,2-Tetrachloroethane	0.5	<5	<5
1,3-Dichlorobenzene	1	<10	<10
1,4-Dichlorobenzene	1	<10	<10
1,2-Dichlorobenzene	1	<10	<10

**NA**

Not Applicable

**MRL**

Method Reporting Limit.

**ND**

None Detected at or above the method reporting limit.

\*

MRL is elevated because the sample required diluting.

Approved By:

*Eydie Schwartz*

Date: 12/28/94

3S44/060194

L943859-XLS-R010w (S) 12/28/94  
 6925 CANOGA AVENUE

CANOGA PARK, CA 91303

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FAX 818 587-5555

Page No.:

**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Report

**Client:** AeroVironment, Inc.  
**Project:** Santa Fe Springs  
**Sample Matrix:** Aqueous

**Service Request:** L943859  
**Date Collected:** 12/15/94  
**Date Received:** 12/19/94  
**Date Extracted:** NA

**Halogenated Volatile Organic Compounds**  
**EPA Methods 601**  
**Units: µg/L (ppb)**

201 smb	<b>Sample Name:</b>	<b>MW-206 (14:30)</b>	<b>Method Blank</b>
	<b>Lab Code:</b>	L943859-013*	L943859-MB
	<b>Date Analyzed:</b>	12/20/94	12/20/94

<b>Analyte</b>	<b>MRL</b>		
Dichlorodifluoromethane (Freon 12)	5	<50	ND
Chloromethane	5	<50	ND
Vinyl Chloride	5	<50	ND
Bromomethane	5	<50	ND
Chloroethane	5	<50	ND
Trichlorofluoromethane (Freon 11)	0.5	<5	ND
1,1-Dichloroethene	2	150	ND
Methylene Chloride	2	<20	ND
trans-1,2-Dichloroethene	0.5	<5	ND
cis-1,2-Dichloroethene	0.5	59	ND
1,1-Dichloroethane	0.5	14	ND
Chloroform	0.5	<5	ND
1,1,1-Trichloroethane (TCA)	1	<10	ND
Carbon Tetrachloride	0.5	<5	ND
1,2-Dichloroethane	0.5	5.1	ND
Trichloroethene (TCE)	0.5	84	ND
1,2-Dichloropropane	0.5	<5	ND
Bromodichloromethane	0.5	<5	ND
2-Chloroethyl Vinyl Ether	5	<50	ND
trans-1,3-Dichloropropene	0.5	<5	ND
cis-1,3-Dichloropropene	0.5	<5	ND
1,1,2-Trichloroethane	0.5	<5	ND
Tetrachloroethene (PCE)	0.5	21	ND
Dibromochloromethane	0.5	<5	ND
Chlorobenzene	0.5	<5	ND
Bromoform	0.5	<5	ND
1,1,2,2-Tetrachloroethane	0.5	<5	ND
1,3-Dichlorobenzene	1	<10	ND
1,4-Dichlorobenzene	1	<10	ND
1,2-Dichlorobenzene	1	<10	ND

**NA**

Not Applicable

**MRL**

Method Reporting Limit.

**ND**

None Detected at or above the method reporting limit.

\*

MRL is elevated because the sample required diluting.

Approved By:

*Eydie Schwartz*

Date: 12/28/94

3S44/060194

L943859-XLS-8010w (6) 12/28/94  
 6925 CANOGA AVENUE

CANOGA PARK, CA 91303

818 587-5550

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Page No.:

**COLUMBIA ANALYTICAL SERVICES, INC.****QA/QC Report**

**Client:** AeroVironment, Inc.  
**Project:** Santa Fe Springs  
**Sample Matrix:** Aqueous

**Service Request:** L943859  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** NA

**Surrogate Recovery Summary  
Volatile Organic Compounds  
EPA Method 624**

Sample Name	Lab Code	Percent Recovery		
		Pentafluorobenzene	Toluene-D <sub>8</sub>	4-Bromofluorobenzene
TRIP BLANK	L943859-001	110	92	103
MW-104	L943859-002	111	92	104
MW-205	L943859-003	111	91	101
MW-101	L943859-004	113	103	102
MW-204	L943859-005	115	90	95
MW-203	L943859-006	114	92	96
MW-103	L943859-007	123	90	90
MW-502	L943859-008	118	91	93
FIELD BLANK	L943859-009	116	92	94
MW-503	L943859-010	110	103	99
MW-206 (12:04)	L943859-011	117	92	96
MW-504	L943859-012	117	100	89
MW-206 (14:36)	L943859-013	112	91	95
Method Blank	L943859-MB	109	90	102
Matrix Spike	L943804-3MS	105	91	98
Duplicate Matrix Spike	L943804-3DMS	110	95	97

CAS Acceptance Limits: 70-130                    88-110                    86-115

NA                    Not Applicable

Approved By:

*Eydie Schwartz*

Date: 12/28/94

SUR3/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

**Client:** AeroVironment, Inc.  
**Project:** Santa Fe Springs  
**Sample Matrix:** Aqueous

**Service Request:** L943859  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 12/18/94

Matrix Spike/Duplicate Matrix Spike Summary

Halogenated Volatile Organic Compounds

EPA Methods 601

Units:  $\mu\text{g/L}$  (ppb)

**Sample Name:** Batch QC  
**Lab Code:** L943829-004

Analyte	Percent Recovery								
	Spike Level		Sample Result	Spike Result		MS	DMS	Acceptance Limits	Relative Percent Difference
	MS	DMS		MS	DMS				
1,1-Dichloroethene	20.0	20.0	ND	24.6	24.1	123	121	28-167	2
Trichloroethene	20.0	20.0	1.00	25.0	25.6	120	123	35-146	2
Tetrachloroethene	20.0	20.0	ND	25.3	24.8	127	124	26-162	2
1,1,1-Trichloroethane	20.0	20.0	ND	27.5	26.1	138	131	41-138	5
1,2-Dichloroethane	20.0	20.0	ND	22.4	22.8	112	114	51-147	2

NA

Not Applicable

ND

None Detected at or above the reporting limit

Approved By:

DMSISRPD/061394

*Eydie Schwartz*

Date: 12/28/94

**COLUMBIA ANALYTICAL SERVICES, INC.****QA/QC Report**

**Client:** AeroVironment, Inc.  
**Project:** Santa Fe Springs  
**Sample Matrix:** Aqueous

**Service Request:** L943859  
**Date Collected:** NA  
**Date Received:** NA  
**Date Extracted:** NA  
**Date Analyzed:** 12/19/94

**Matrix Spike/Duplicate Matrix Spike Summary****Volatile Organic Compounds**

EPA Method 624

Units:  $\mu\text{g/L}$  (ppb)

**Sample Name:** Batch QC  
**Lab Code:** L943804-003

<b>Analyte</b>	<b>Percent Recovery</b>								<b>Relative Percent Difference</b>
	<b>Spike Level</b>		<b>Sample Result</b>	<b>Spike Result</b>		<b>CAS</b>		<b>Acceptance Limits</b>	
	<b>MS</b>	<b>DMS</b>		<b>MS</b>	<b>DMS</b>	<b>MS</b>	<b>DMS</b>		
1,1-Dichloroethene	5.0	5.0	ND	3.9	4.2	78	84	61-145	7
Benzene	5.0	5.0	ND	4.3	4.8	86	96	76-127	11
Trichloroethene	5.0	5.0	ND	4.7	5.2	94	104	71-120	10
Toluene	5.0	5.0	ND	4.0	4.2	80	84	76-125	5
Chlorobenzene	5.0	5.0	ND	4.4	4.6	88	92	75-130	4

**NA**

Not Applicable

**ND**

None Detected at or above the method reporting limit.

Approved By: Eydie SchwartzDate: 12/28/94

DMS1S/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: AeroVironment, Inc.  
Project: Santa Fe Springs  
Sample Matrix: Aqueous

Service Request: L943859  
Date Collected: NA  
Date Received: NA  
Date Extracted: NA  
Date Analyzed: NA

Surrogate Recovery Summary  
Halogenated Volatile Organic Compounds  
EPA Methods 601

Sample Name	Lab Code	Percent Recovery 4-Bromofluorobenzene
TRIP BLANK	L943859-001	103
MW-104	L943859-002	113
MW-205	L943859-003	135*
MW-101	L943859-004	120
MW-204	L943859-005	113
MW-203	L943859-006	118
MW-103	L943859-007	122
MW-502	L943859-008	126
FIELD BLANK	L943859-009	119
MW-503	L943859-010	100
MW-206 (12:04)	L943859-011	108
MW-504	L943859-012	109
MW-206 (14:36)	L943859-013	121
Method Blank	L943859-MB	106
Matrix Spike	L943829-4MS	116
Duplicate Matrix Spike	L943829-4DMS	111

CAS Acceptance Limits: 50-130

NA Not Applicable

\* Not Applicable because of the sample matrix. The gas chromatogram showed target components that interfered with determination of the surrogate.

Approved By: Eydie Schwartz  
SUR1/062994

Date: 12/28/94